Mothers' perceptions of complementary feeding and the influence of context on child feeding practices

– Qualitative study in rural area of Southern Benin

Master's thesis

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Tiivistelmä/Referat – Abstract

Malnutrition in early life has long-lasting and irreversible consequences, and it is estimated to be the cause of nearly half of the deaths in children under the age of five. Most child undernutrition occurs in the period of complementary feeding, when breast milk is gradually being replaced by complementary foods. Undernutrition is caused by inadequate nutrient and energy intakes and diseases that result from poor feeding practices. Complementary feeding includes a complex set of behaviours and decisions, which are in turn influenced by a vast number of determinants, such as caregiver's knowledge and skills, time constraints, social support system and community context. The aim of this study is to qualitatively investigate mothers' perceptions of complementary feeding and to evaluate the influence of household and community context on complementary food choices in rural area of Southern Benin. Child undernutrition is extremely prevalent in Benin, and 45 % of children under the age of five are chronically malnourished.

Two remote rural villages in the Mono region of Benin were selected for the study. The sample consisted of mothers who had a child aged 6 to 24 months. Purposeful sampling was used. Data was collected through individual interviews with structured and open-ended questions (n=30) and six focus group discussions. Four groups were organised for caregivers (n=34) and two for healthcare and social workers in the region (n=13). Translated and transcribed data was systematically coded with the Atlas.ti program and analysed using qualitative content and thematic analysis. The analysis was inductive and data-driven. Data and methodological triangulation were used in order to evaluate the validity and credibility of data, which was collected using different research methods.

Young children in the villages were not fed according to WHO recommendations. Complementary foods lacked variety and especially animal-source foods were limited. Children were usually fed maize gruel or porridge, which were seldom supplemented with more nutritious ingredients. Four themes were formed of the determinants of feeding practices: maternal knowledge framework, child characteristics, household context and community context. Mothers had several ways to rationalise why certain foods were better than others. Mothers considered macaroni, maize gruel and porridge to be the most suitable and healthy foods for young children. However, mothers also valued locally available, more nutritious products, such as eggs, beans and green leafy vegetables. No food taboos concerning feeding of young children existed in the villages. Children started eating family foods from a very early age, and separate foods were hardly ever prepared for them.

Mothers made many feeding decisions based on children's behaviour, cues and development level. Mothers seemed to have quite a lot of power over infant feeding decisions on the household level, but also the older generation and fathers influenced feeding choices. Fathers decided how money was spent in the household and grandmothers tried to maintain the traditional ways of child care. The main reason for poor feeding practices was poverty, which limited the choice of foods and the time mothers had for child care. Rural migration led to fathers being absent from families, increasing mothers' work burden. These results suggest that there are several possible barriers and also enablers of optimal complementary feeding in the study villages.

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Tiivistelmä/Referat – Abstract

Varhaisella virheravitsemuksella on pitkäkestoisia ja peruuttamattomia seurauksia. Se aiheuttaa miltei puolet alle viisivuotiaiden lasten kuolemista maailmassa. Suurin osa lasten aliravitsemuksesta ilmenee, kun heille aletaan yksinomaisen imetyksen jälkeen antaa lisäruokia. Aliravitsemus johtuu riittämättömästä energian ja ravintoaineiden saannista sekä huonoista ruokintatavoista aiheutuvista sairauksista. Lisäruokintatapoihin ja ruokien valintaan vaikuttavat lukuisat eri tekijät, kuten hoivaajan tieto ja taidot, käytettävissä oleva aika, sosiaaliset turvaverkostot ja paikallinen konteksti. Tämän tutkielman tarkoituksena on tutkia laadullisesti äitien käsityksiä lasten lisäruokinnasta sekä arvioida kotitalouden ja yhteisöjen tasolla vaikuttavien tekijöiden merkitystä ruokien valintaan Etelä-Beninin maaseudulla. Lasten aliravitsemus on erittäin yleistä Beninissä: jopa 45 % alle viisivuotiaista lapsista on kroonisesti aliravittuja.

Tutkimukseen valittiin kaksi syrjäistä maalaiskylää Monon maakunnasta. Harkinnanvaraista otantaa käyttämällä tutkimukseen rekrytoitiin äitejä, joilla oli 6–24 kuukauden ikäinen lapsi. Aineisto kerättiin yksilöhaastatteluilla, joissa oli strukturoituja ja avoimia kysymyksiä (n=30). Lisäksi toteutettiin kuusi fokusryhmäkeskustelua; kaksi äideille (n=34) ja kaksi alueen terveys- ja sosiaalityöntekijöille (n=13). Litteroitu ja käännetty aineisto koodattiin systemaattisesti Atlas.ti-ohjelmalla ja analysoitiin aineistolähtöisesti sisältö- ja teema-analyysillä. Aineisto- ja metodologiatriangulaatiota käytettiin eri menetelmillä kerätyn aineiston luotettavuuden ja uskottavuuden arviointiin.

Lasten ruokinta ei ollut Maailman terveysjärjestö WHO:n suositusten mukaista. Lisäruoat olivat yksipuolisia, ja erityisesti eläinperäisiä ruokia oli lasten ruokavaliossa vähän. Lapsille syötettiin lähinnä maissivelliä tai -puuroa, joihin harvoin lisättiin ravintoarvoa parantavia raaka-aineita. Aineistosta muodostettiin neljä teemaa, jotka kuvaavat lisäruokintaan vaikuttavia tekijöitä: äitien tiedon viitekehys, lapsen ominaisuudet, kotitalouksien konteksti ja yhteisöjen konteksti. Äideillä oli monia perusteluja sille, miksi jotkin lisäruoat olivat parempia kuin toiset. Äitien mielestä makaroni sekä maissivelli ja -puuro olivat lapsille sopivinta ja terveellisintä ruokaa. He arvostivat myös paikallisesti saatavilla olevia, ravintoarvoltaan hyviä ruokia, kuten papuja, munia ja vihreitä lehtivihanneksia. Kylissä ei havaittu lisäruokintaan vaikuttavia ruokatabuja. Lapsille ei yleensä tehty omia ruokia, vaan he alkoivat syödä samaa ruokaa kuin muukin perhe jo hyvin varhain. Äidit tarkkailivat lasten kehitystä ja käyttäytymistä ja tekivät ruokintapäätöksiä niihin perustuen.

Äideillä oli melko paljon vaikutusvaltaa lasten ruokintaan kotitalouksissa, mutta myös isät ja isoäidit vaikuttivat ruokavalintoihin. Isät päättivät miten perheissä käytettiin rahaa, ja isoäidit puolustivat perinteisiä lastenhoitotapoja. Merkittävin lasten ruokintaa heikentävä tekijä oli köyhyys, joka rajoitti ruokien saatavuutta ja äitien aikaa lasten hoitamiseen. Isien työperäinen muutto lisäsi äitien työmäärää kotitalouksissa. Näiden tulosten perusteella tutkimuskylissä on useita esteitä ja kannusteita suositusten mukaiselle lasten lisäruokinnalle.

Avainsanat – Nyckelord – Keywords

Lisäruoka, lasten ruokinta, imeväisten ruokinta, ruokintatapa, Benin, laadullinen

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Silja Nousiainen
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CONTENTS

ABBREVIATIONS AND DEFINITIONS

DHS	Demographic and Health Surveys
FAO	Food and Agriculture Organization of the United Nations
HIV/AIDS	Human immunodeficiency virus infection/ Acquired immunodeficiency syndrome
MDG	Millennium Development Goal
NGO	Non-governmental organization
PAHO	Pan-American Health Organization
ProPan	Process for the Promotion of Child Feeding Field Manual
UNICEF	United Nations International Emergency Children's Fund
WHO	World Health Organization

1. INTRODUCTION

Inappropriate feeding practices during the first two years of life are a major cause of undernutrition in young children. The number of global deaths and disability-adjusted life-years caused by undernutrition constitutes the largest proportion of any risk factors in children under the age of five (Black et al. 2013). Unbalanced nutrition in early life also has long-lasting and irreversible consequences, including growth failure, poor resistance to infections and impaired learning capabilities (Victora et al. 2008). Children who are undernourished during the first two years of life and who then gain weight rapidly later in childhood, are in greater risk of chronic diseases in later life.

The incidence of undernutrition rises rapidly during the period of complementary feeding from the age of 6 months until 18 months in many developing countries (Victora et al. 2010, Black et al. 2008). Complementary feeding is the vulnerable period of transition from exclusive breastfeeding to family diet. World Health Organization (WHO) recommends that children should receive adequate, safe and appropriate complementary foods from six months onwards while continuing to be breastfed until two years of age (PAHO 2003). Undernutrition is caused by inadequate nutrient and energy intakes and diseases resulting from poor complementary feeding practices, such as giving children foods of poor quality, feeding them inadequately and disregarding food and water safety (Bhutta et al. 2013, Stewart et al. 2013, Arimond & Ruel 2004, Umeta et al. 2003). Breastfeeding and complementary feeding counselling, as well as improving the quality of foods given to children, are some of the most prominent interventions to reduce child mortality and morbidity (Bhutta et al. 2008).

Complementary feeding includes a complex set of behaviours. There is now a shared understanding in the field of nutrition and public health that complementary feeding is not only about *what* is fed, but also *how*, *when*, *where* and *why* (Pelto et al. 2003, Engle et al. 1997). Complementary feeding includes practices such as introduction of first foods, preparation and choice of foods and style of feeding. These practices are in turn influenced by a vast number of determinants (Stewart et al. 2013, Pelto et al. 2003), such as caregiver's knowledge, perceptions and beliefs, as well as their time constraints, employment and social support (Pelto et al. 2003, Engle et al. 1997). Furthermore, the local context, such as culture, economy, agriculture and healthcare, affects practices and feeding decisions (Black et al. 2013, Stewart et al. 2013, Paul et al. 2011).

In the past two decades, significant progress has been made in implementing policies and programs that aim to protect, promote and support breastfeeding in developing countries. However, the scientific evidence of efficacy and effectiveness of strategies to improve complementary feeding practices has been limited (Dewey & Adu-Afarwuah 2008). Unlike "optimal breastfeeding", the notion of "optimal complementary feeding" has not been clearly articulated, until recently. The indicators for measuring complementary feeding practices were published only in 2008 (WHO 2008).

As most child undernutrition occurs in the very vulnerable period of complementary feeding, more research is needed on determinants that influence feeding practices. Moreover, the voice of women, the primary caregivers, is seldom heard, since the research often focuses on quantitative, 'hard' facts about what is fed. There is a need for qualitative studies that aim to understand the constraints that prevent women from feeding their children according to recommendations. More importantly, it is crucial to gain more understanding of enabling factors that may already exist in poor communities that could facilitate optimal complementary feeding.

The aim of the present study is to investigate mothers' perceptions of complementary feeding and to evaluate the influence of household and community context on their complementary food choices in rural area of Southern Benin. Benin is a low-income-country on West African coast, where child undernutrition is extremely prevalent; 45 % of children under the age of five are stunted and thus chronically malnourished (INSAE & ICF International 2013). According to the Food and Agriculture Organization (FAO), determinants of high incidence of chronic child malnutrition in Benin are inadequate feeding practices, poor diversity of complementary foods, limited access to health services and high incidence of poverty (FAO 2011). Only few published studies have, however, investigated complementary feeding in Benin.

This study was conducted within a research project carried out by the University of Helsinki, University of Abomey Calavi and Bioversity International. The goal of the larger research project is to investigate the links between agrobiodiversity, dietary diversity and nutritional status of young children by focusing on complementary feeding of 6 to 24-month-old children. This study was made during the preparatory phase of the project under the ethical permission from the University of Abomey Calavi.

2. LITERATURE REVIEW

2.1 Complementary feeding

World Health Organization (WHO) defines complementary feeding "as the process starting when breast milk alone is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk" (PAHO 2003). Complementary feeding is thus the transition period from exclusive breastfeeding to the family diet.

WHO recommends that complementary feeding should be *timely*, *adequate*, *safe* and *appropriate* (PAHO 2003). Timely introduction of complementary foods means giving children the first foods from six months onwards. Complementary foods should meet the nutritional needs of the growing child and their variety, amounts, consistency and feeding frequency should be adequate. All measures should be taken to prevent contamination with pathogens. The texture of the foods should be appropriate for the child's age, and they should be fed by being sensitive to the child's cues.

In the following section I will describe the consequences of poor feeding practices on child growth. This will then be followed by an explanation of optimal child feeding practices. Finally I will discuss the feeding practices and children's nutritional status in Benin.

2.1.1 Consequences of inappropriate complementary feeding practices

Poor complementary feeding practices lead to an increased risk of infections and impaired development and growth, also called *stunting*. Stunting occurs when child does not grow enough to meet his height potential. A child is considered to be stunted and thus chronically malnourished if his height-for-age is below two standard deviations of the WHO's child growth standard median (WHO 2006). Globally, in 2011 165 million children under the age of five were stunted (Black et al. 2013). Highest prevalence of stunting is in Africa where around 36 % of children under the age of five are stunted. However, the largest number of stunted children is found in south-central Asia.

Stunting can begin already in utero and continue for the first two years after birth. Most of stunting occurs in the period of complementary feeding from 6 until 24 months of age (Victora

et al. 2010). A study in Malawi (Dewey & Huffman 2009) investigated growth retardation in different age periods: at three years, children were on average ten centimetres shorter compared to the WHO growth standard. Of this difference, 20 % was already present at birth and 20 % occurred during the first six months. Half of the impairment occurred at 6–24 months and the remaining 10 % in the third year.

Consequences of stunting

There is strong evidence that stunting has both short and long-term health consequences (Black et al. 2013). Poor nutritional status and infections form a vicious cycle. Malnutrition increases the risk of infections by its negative impact on the epithelial barrier function and altered immune response (Brown 2003). Infections on the other hand may impair the nutritional status through impaired absorption of nutrients, reduced appetite, increased catabolism and direction of nutrients towards immune response, taking away from growth (Stewart et al. 2013, Brown 2003).

Stunted, underweight and wasted children have an increased risk to die from infectious diseases such as diarrhoea, pneumonia and measles. In 2011, child undernutrition, including foetal growth restriction, suboptimal breastfeeding, stunting, wasting and deficiencies of vitamin A and zinc, was globally responsible for 45 % of deaths in children younger than five years, accounting for a total of 3.1 million deaths (Black et al. 2013). In addition to increased mortality and morbidity, short-term consequences of stunting include increased household expenses for the care of a sick child (Stewart et al. 2013).

Stunting in early childhood is a key marker of processes that lead to poor growth and other harmful outcomes (Dewey & Begum 2011). There is growing evidence that small size at birth and childhood stunting is linked to physical health and educational and economic performance in later life. Besides shorter height at adulthood, stunting can lead to reduced lean body mass, less schooling, poorer intellectual capacity, reduced earnings and lower birth weight of infants born to women who were stunted in their childhood (Victora et al. 2008). Associations with adult diseases are not so clear. There is evidence that lower birth weight and undernutrition in childhood are risk factors for high blood pressure and glucose concentrations, as well as adverse blood lipid profiles. The risk of chronic diseases in adulthood increases, if undernourished children gain weight rapidly after infancy. Furthermore, micronutrient deficiencies can cause stunted development, even when growth is not affected (Stewart et al. 2013). Especially

deficiencies of iron and iodine can have irreversible and long-term effects on cognitive and neural development.

Some of the adverse effects of stunting are irreversible and permanent, and thus interventions should be carried out when most of stunting occurs. The 'window of opportunity' for stunting prevention includes the period from pre-conception to pregnancy and until the first two years of life (Bhutta et al. 2013, Victora et al. 2010, Dewey & Adu-Afarwuah 2008).

2.1.2 Optimal feeding practices

Poor complementary feeding practices, such as giving children foods of poor quality, feeding them inadequately and disregarding food and water safety, have been directly associated with stunting (Bhutta et al. 2013, Stewart et al. 2013). In the following section I will describe the optimal child feeding practices.

Exclusive breastfeeding

The introduction of complementary foods at six months of age also prolongs the duration of exclusive breastfeeding, which has several benefits both for the mother and child (Kramer & Kakuma 2012). Mother's milk is clean and safe food for infants and breastfeeding reduces the risk of being exposed to food-borne pathogens. Breast milk protects the child against gastrointestinal infections, which are major cause of child mortality in developing countries. Non-breastfed children may be predisposed to growth retardation for example through inadequate energy intake, nutrient deficiencies and removal of the immunological protection of breast milk (Simondon et al. 2001, Onyango et al. 1999).

Vitamin deficiencies are usually rare in exclusively breastfed children, provided that the mother is well nourished. When the mother's diet is insufficient, children's intake of certain vitamins and minerals may be inadequate, usually concerning iron, zinc, riboflavin or vitamins A, D, B6 or B12 (PAHO 2003). In these situations, improving the mother's diet or providing supplements is the recommended treatment, rather than giving complementary foods.

Adherence to the recommendation of exclusive breastfeeding for six months is low in many countries. According to a meta-analysis of data from 94 developing countries, the prevalence of exclusive breastfeeding among children aged six months or younger is estimated to be 39 %

(Lauer et al. 2004). Recent meta-analysis of Demographic Health Survey (DHS) data from 28 developing countries noted that only one-fourth of caregivers practiced exclusive breastfeeding during the first six months of baby's life. However, nearly three-fourths replied that they had continued breastfeeding beyond one year (Arabi et al. 2012).

Complementary feeding of the breastfed child

WHO recommends that breastfeeding should be continued until the child is two years or older as breast milk is an important nutritional component of children's diet (PAHO 2003). In addition, breastfeeding for more than one year increases the growth of infants and toddlers (Dewey & Brown 2003). Breastfed children aged 12 to 23 months receive about 35–40 % of total energy from breast milk. Breast milk makes an important contribution to the nutrient needs of young child, especially concerning protein, essential fatty acids and many vitamins. Breast milk is however often low in minerals such as iron and zinc, so they should be received from complementary foods.

After six months, the nutrient demands of children can no longer be met by breast milk alone (PAHO 2003). Most children are at this point developmentally ready for other foods (Naylor & Morrow 2001). The appropriate consistency of complementary foods for certain age is based on child's neuromuscular and motor development and teeth eruption. At six months of age, children are able to eat pureed, mashed and semi-solid foods (PAHO 2003). Food consistency should be increased as the child gets older. By the age of eight months, most children are able to eat "finger foods", e.g. foods that are chopped to small pieces. At the age of 12 months children can usually begin eating family foods.

Low quantity of foods, as well as low feeding frequency, are known to be associated with stunting (Umeta et al. 2003). WHO recommends that children aged six to eight months should be given complementary foods two to three times a day, and additionally one or two nutritional snacks, if desired. From nine months onwards, children should be given three to four meals a day with snacks (PAHO 2003). However, adherence to this recommendation is low. According to a meta-analysis of data from developing countries, only half of caregivers of six to eight-month-old children reported that they had given complementary foods to their children during the previous day (Arabi et al. 2012).

As young children have small stomachs they can only consume half to one cup of supplementary foods per feeding. The nutrient density of foods should therefore be high and foods should be offered several times a day (PAHO 2003). Excessive diluting of foods should be avoided as it increases the quantity of foods too large for small children (Umeta et al. 2003). The energy density of complementary foods should, however, be adequate and not too high, as meals with high energy density might decrease the daily breast milk consumption (Islam et al. 2008).

High dietary diversity of complementary foods is important for ensuring inadequate nutrient intake (Arimond & Ruel 2004). Children may lack essential nutrients if their diets are limited with animal source foods (Krebs 2007) or have s high content of anti-nutrients, such as phytates and polyphenols, which are common in plant-based diets (Gibson et al. 2010). Therefore, WHO recommends that meat, poultry, fish or eggs should be eaten daily or as often as possible (PAHO 2003). Also vitamin A-rich fruits and vegetables should be eaten on daily basis. Furthermore, foods should contain enough soft fat. If needed, children can be given vitamin-mineral supplements or fortified products.

The effect of micronutrient intakes on stunting has been a matter of debate. Low intake of zinc has been associated with growth retardation (Imdad & Bhutta 2011, Brown et al. 2009), but the effect of vitamin supplementation on growth has yielded contradictory results. Cross-sectional studies have shown vitamin A deficiency to be associated to a greater risk of stunting, but studies on causal relation between vitamin A status and growth have not been published (Ramakrishnan et al. 2009). Multiple micronutrient interventions with a minimum of three micronutrients have shown small but promising effects on linear growth. Micronutrient supplementation may be an effective intervention to reduce stunting, along with more comprehensive strategies such as improving diet, exclusive breastfeeding and complementary feeding practices (Bhutta et al. 2008).

Food safety and the style of feeding

Childhood diarrhoea and other infections impair the growth of young children. Therefore, foods should be prepared in a safe manner to prevent contamination with microbial pathogens, which are major cause of infections in young children (PAHO 2003). To safely prepare complementary foods, they should be stored hygienically, and utensil, bowls and cups used in preparation and feeding should be clean. Both the caregiver's and the child's hands should be washed before food preparation and feeding. Using bottles should be avoided as they are difficult to keep clean.

The concept of appropriate feeding includes also the style of feeding. Responsive feeding applies the principles of psycho-social care (Pelto et al. 2003, Engle et al. 2000). This means that caregivers are sensitive to the child's hunger and satiety cues. They should either feed children or assist them when they eat by themselves. The feeding situation should be calm; children should be fed slowly and patiently, and they should be encouraged, but not forced, to eat. Distractions during meal times should be minimized if the child is prone to lose interest quickly. If children refuse foods, caregivers should experiment with different food combinations, tastes and textures. Feeding times are also periods for learning and love: during feeding children should be talked to with eye-to-eye contact. The nonresponsive, passive style of feeding (the so called *laissez-faire* style) has been observed in communities with high prevalence of malnutrition (Engle et al. 2000, Dettwyler 1986). The current scientific evidence of the association of responsive feeding with child growth is weak, but promising (Bentley et al. 2011). Responsive feeding is especially important during illness and convalescence, when the child's appetite is often poor.

2.1.3 Child malnutrition and feeding practices in Benin

Child malnutrition is prevalent in Benin. According to the Demographic Health Survey (DHS) statistics, 45 % of children aged under five are stunted and 58 % are anaemic (INSAE & ICF International 2013). Prevalence of stunting increases with age: while 20 % of under-5-month-olds are stunted, its prevalence among children aged 24–35 months is already 50 %. Malnutrition is slightly more common in rural areas (46 %) compared with urban areas (42 %). Despite a large prevalence of chronic undernutrition, prevalence of obesity is at the same time increasing, especially in urban areas (FAO 2011). Nine percent of children under five years of age were overweight in 2006.

In 2011 it was estimated that nearly one-fourth of the population in Benin were food insecure (MDAEP & INSAE 2012). This figure does not completely reflect the number of chronically undernourished children. As nearly half of the children are stunted, it is possible that the children do not have and adequate diet, even if it was available on the household level. However, complementary feeding practices have not been thoroughly investigated in Benin, and published studies are limited. Those that were found concerned mostly breastfeeding, or breastfeeding in the case of HIV/AIDS, or were relatively old (Goyea & Johnson 1977) or only abstracts were available (Chague et al. 2013, Sinnaeve et al. 2006). Figures referred to in this section have been

obtained from FAO, DHS and UNICEF reports. To my knowledge, no published studies have qualitatively investigated complementary feeding practices in Benin.

Breastfeeding is common in Benin: at 6–8 months of age, nearly all children (93 %) are breastfed. At the age of two years, over half of the children are still breastfed (INSAE & ICF International 2013). Even though breastfeeding is commonly practiced, only one-third of children are exclusively breastfed at the age of five months. Breastfeeding practices have improved during the last few years; early initiation and exclusive breastfeeding are now more common than before. According to UNICEF (2009), breastfeeding has been promoted in many projects, but complementary feeding has not received as much attention.

According to DHS data, complementary feeding in Benin lacks diversity and quality. Only six out of ten children aged 6–8 months had received complementary foods on the day prior to the day of the research (INSAE & ICF International 2013). Furthermore, only one-third of 6–23-month-olds had a diet that had minimum dietary diversity, meaning that they had eaten foods from at least four different food groups in a day. Only 43 % of children met the minimum meal frequency. Therefore, only 18 % of children had a minimum acceptable diet, according to the WHO criteria. Moreover, the bioavailability of nutrients is also low in children's diets, especially regarding iron, vitamin A and calcium, which expose children to micronutrient deficiencies (FAO 2011).

Complementary feeding in Benin consists mainly of cereal porridges with legumes (peanut or soy) or small fish (FAO 2011). It is common to add vegetable oil to cereal porridges. According to DHS data, among children aged 6 to 23 months, cereals were the most common food group, consumed by two-thirds of breastfed children who had been given foods on the previous day (INSAE & ICF International 2013). Roots and tubers were eaten by 36 % and legumes and nuts by 33 % of children. Vitamin A rich fruits and vegetables were eaten by nearly 40 per cent and other fruits and vegetables by 24 % of young children in the DHS study. According to FAO, vitamin A rich foods are limited in children's diets (FAO 2011). However, red palm nut oil or juice based sauces may constitute an important source of vitamin A for young Beninese children (Amoussa-Hounkpatin et al. 2012). Milk, milk products, meat and eggs are rare in young children's diet. In the DHS study, one-third of respondents had eaten meat and fish and one-fourth cheese, yogurt or other dairy products (INSAE & ICF International 2013). Eggs were consumed by 15 % of young children

Finally, some traditional infant feeding practices that impair the nutritional status of young children have been identified, such as giving herbal teas, water, and other foods to babies at young age (UNICEF 2009). Problems in feeding the child properly during illnesses have also been detected (FAO 2011).

2.2 Determinants of complementary feeding practices

The importance of cultural and behavioural factors in children's nutrition has been recognized only for a decade or so. Research has shown that dietary quality and quantity do not account for all the variance in nutrient intake. On the contrary, practices related to how food is provided and fed to children are also important (e.g. Bentley et al. 2011, Dettwyler 1986 and 1987). Caregiving behaviour is now understood to be an important part of children's nutrient intake and therefore of their nutritional status.

Complementary feeding includes a complex set of behaviours. Feeding complementary foods demands much more from the caregiver than just the selection and preparation of food (Engle et al. 1997). The caregiver must decide, for example, when, where, how and how many times a day to feed the child. Children's basic needs are similar in all societies, but care practices and resources vary across cultures – and even within small communities. Furthermore, complementary feeding behaviours and practices may have context-specific barriers (Stewart et al. 2013). Figure 1 represents factors that influence complementary feeding practices ranging from caregiver resources to factors at household and community level. The picture combines results from several studies that I will now describe in more detail.

2.2.1 Complementary feeding resources and context

Caregiver resources

In 1990 UNICEF presented a conceptual framework that suggested that care for women and children to be equally important as food security and healthcare services (UNICEF 1990). All three elements must be adequate in order to prevent child malnutrition. The framework proposes that good care can improve children's nutritional status and health, even when food security or availability of healthcare services are poor. The extended model of care, or *care framework*, was published in 1997 by Engle and others. Care refers to the "behaviours and practices of caregivers that provide food, healthcare, stimulation and emotional support necessary for children's healthy

growth and development" (Engle et al. 2000). The care framework lists six care practices: care for women, food preparation and storage, hygiene practices, health practices, psychosocial care and cognitive stimulation, and feeding and breastfeeding.

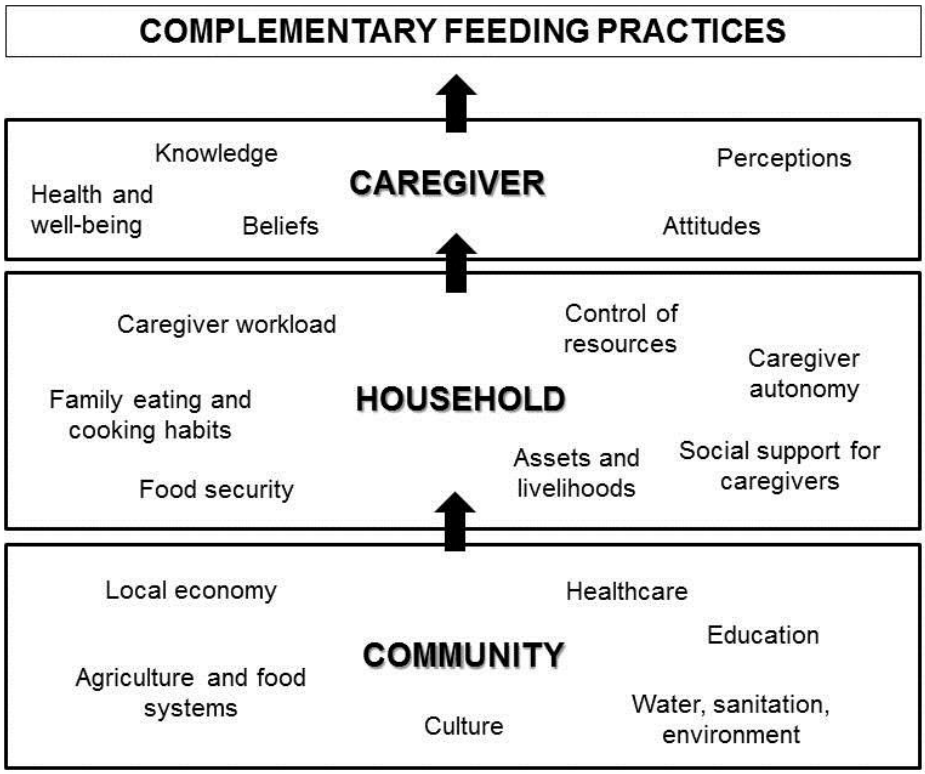

Figure 1: Complementary feeding resources and contextual determinants (adapted from Black et al. 2013, Stewart et al. 2013, Paul et al. 2011, Pelto et al. 2003 and Engle et al. 1997)

The amount and quality of care are dependent on many factors (Engle et al. 1997). The care framework presents three sets of resources that are needed for good care: food and economic resources, caregiver resources and health resources. Caregiver resources are factors that affect the caregivers' ability to provide care and complementary feeding. They include caregivers' knowledge and beliefs, physical and mental health and additionally the lack of stress and good self-confidence. Furthermore, resources include caregivers' autonomy, time constraints and social support network.

The conceptualization of caregiver resources was continued in a review by Pelto et al. (2003). Applying thematic analysis to 18 ethnographic studies, they formed four categories of proximal determinants within the context of caregiving behaviours. As in the care framework, the

determinants included caregiver's beliefs, knowledge and perceptions, in addition to the health of the caregiver and other family members as well as competing demands on caregiver's time. The categories formed in the analysis included also social pressure and social support in caregiver's immediate social network. According to Pelto et al. these determinants are potentially modifiable through intervention activities. The determinants are not definite, but writers believe that they are likely to be important in various cultural settings.

The influence of context

In order to change behaviour, we must understand the context within which the behaviour occurs. Context can be defined as "the set of circumstances surrounding something" (Paul et al. 2011). The context is represented as an underlying factor or cause in the UNICEF framework for child undernutrition (UNICEF 1990) and in the care framework (Engle et al. 1997). The cultural, political and social context affects the availability and quality of caregiver resources, and in turn the care of children.

An effort has been made by scientists to describe the impact of child undernutrition on national and global context, meaning, for example, the influence of stunting on social, cultural, physical, economic and political factors. However, there is a lack of research on how the context influences the origins of undernutrition. Complementary feeding interventions usually concentrate on the most proximal causes of child undernutrition – inadequate nutrition intake and complementary feeding practices – while the influence of context has not received as much attention (Stewart et al. 2013). Pelto et al. (2003) argues that in the planning of interventions the community context should be taken into consideration, instead of focusing solely on caregiver and household-level factors, such as caregiver resources and feeding practices. Three recent studies, two reviews (Black et al. 2013, Stewart et al. 2013) and one formative research (Paul et al. 2011), have tried to conceptualize the contextual factors that influence complementary feeding practices and thus extend the widely used UNICEF and care frameworks. Some of the contextual determinants at the household and community level, described in the articles by Black et al (2013), Stewart et al. (2013) and Paul et al. (2011), are presented in figure 1.

In 2008 Lancet published an article series that discussed maternal and child undernutrition, and the subject was taken up again in 2013. The updated series is guided by a framework that shows "the means to optimum foetal and child growth and development, rather than the determinants

of undernutrition" (Black et al. 2013). This new framework presents dietary, behavioural and health determinants, and explains how they are affected by underlying caregiver resources, food security and environmental conditions. These are in turn affected by larger economic and social conditions, resources and governance, both on national and global levels.

Stewart et al. (2013) developed a conceptual framework for WHO that aims to widen the widely-used UNICEF framework for child undernutrition. They describe context as communal and societal factors that included political economy, education and health and healthcare. Furthermore the framework includes society and culture. Also agriculture and food system together with water, sanitation and environment are part of the model (Stewart et al. 2013).

Paul et al. (2011) examined the way context influences complementary feeding practices in two food-insecure settings in Tanzania and Zimbabwe. He divided context into household and local context. At the household level, influencing factors were family eating behaviours, cooking, sanitation and hygiene resources, food insecurity, poor maternal knowledge, maternal livelihood and poor maternal wellness. Under local context he listed local economy, local agriculture, indigenous ways of learning and knowing, formal education and local ecosystem (Paul et al. 2011).

In the following sections I will now take a look at studies that explain the importance of caregiver education, knowledge and cultural and maternal beliefs. I will also briefly present contextual determinants on the household and communal level that influence complementary feeding. These include control of resources, caregiver workload and social support in addition to the influence of local economy, agriculture and health services. The mental and physical health of mothers is out of the scope of this thesis as well as broader, national-level contextual determinants. The studies chosen for this review have mainly been conducted in Africa, but some relatively recent and interesting examples are also included from other parts of the world.

2.2.2 Maternal knowledge framework

Research has shown that inadequate knowledge about appropriate foods and feeding practices is often a greater determinant of malnutrition than the lack of food or money (PAHO 2003). Caregivers make decision about complementary feeding (what to feed, when and how) in their own "conceptual framework" that I here call the maternal knowledge framework. Models of

maternal knowledge framework help to understand how caregivers themselves conceptualize complementary feeding (Pelto et al. 2003). The framework includes mothers' knowledge that is often a mixture of medical, nutritional and indigenous facts about child feeding and care. The framework also includes cultural beliefs, rules and ideas of foods and feeding. In this section I will discuss how maternal education, maternal knowledge and mothers' beliefs and perceptions influence complementary feeding practices.

Mothers' education and knowledge

Maternal formal education is usually defined by the years of schooling achieved. Caregiver education is an important factor that predicts child health and nutrition outcomes. A vast number of studies have examined the influence of maternal education on breastfeeding. In developed countries, women with higher education usually breastfeed longer and more exclusively (Wachs 2008). The results from research in developing countries are less consistent. In some regions education predicts longer duration of breastfeeding, whereas in other areas more educated women breastfeed their children for a shorter time and less exclusively.

With regard to complementary feeding, lack of caregiver education has a strong and consistent relationship with poor child nutrition outcomes. Higher education is associated with better quality and quantity in children's diets but also better physical growth in infancy and in later childhood (Wachs 2008). Besides feeding practices, it is likely that lack of education also worsens other caring practices associated with stunted development and growth (Imdad et al. 2011, Semba et al. 2008).

Even though mothers' higher education predicts better income for the family, associations between higher education level and child nutrition occur even after controlling for family income and wealth (Wachs 2008). Thus, the family wealth is not necessarily the causal variable. Other mechanisms have been proposed instead. Higher education can, for example, improve caregivers' ability to understand and be more willing to change their behaviour and adopt alternative food preparation methods or recipes (Stewart et al. 2013). Education can also increase caregivers' ability to read and interpret food labels correctly.

Wachs showed in his extensive literature review (2008) that educated mothers may be more involved and skilled in promoting child nutrition and health and that they take a more active role

in family decisions about food purchasing. Moreover, higher education predicts higher maternal involvement in decisions on how family resources are allocated. Education may also improve mothers' access to external resources, such as employment possibilities, which in turn increase their empowerment (Wachs 2008).

However, in a study carried out in Benin (Reed et al. 1996), it was found that mothers' education does not improve child growth for those who live in the poorest economic conditions, because the mothers' capacity to act demands at least a minimal level of economic resources. Mothers with highest education spent, in fact, more time in market activities and less time caring children.

Besides formal education, mothers may obtain knowledge of child feeding from several sources, such as mass media, family members, peers and health services (Appoh & Krekling 2005). Therefore, mothers' level of education is not the only or even the best variable explaining the differences in child feeding practices. Inadequate nutrition knowledge has been reported to worsen child feeding practices in many settings (Paul et al. 2011, Lindsay et al. 2008, Kruger & Gericke 2003). The results from a study by Appoh and Krekling (2005) implied that mothers' practical knowledge about nutrition may be more important than formal education as a predictor of child nutrition outcomes. Therefore, formal education is not the only way to obtain appropriate knowledge of nutrition and child care. Interventions designed to improve knowledge of optimal complementary feeding practices have been relatively successful in reducing stunting and improving linear growth (Bhutta et al. 2013).

Cultural beliefs about foods and feeding

Complementary feeding in communities is structured by local theories of child well-being and the role of feeding in achieving that. Cultural beliefs, knowledge and perceptions influence feeding behaviours and practices (Pelto et al. 2000). In the next few paragraphs I will use the word "belief" to broadly describe maternal knowledge, perception and ideas about child feeding. The term "belief" may include some religious or traditional beliefs, but is not limited to them only. Belief might include the scientific concept of vitamins or more general cultural constructs such as the humoral medical system of "hot" and "cold" beliefs. Many anthropological studies use the word belief broadly to comprehend caregivers understanding and conceptualization of complementary feeding (Pelto et al. 2000).

Caregivers have their own understanding of the properties of complementary foods, their nutritional value, safety and relation to illness (Dutta et al. 2006). Caregivers assign attributes to foods and evaluate whether they are good, bad or neutral. The beliefs related to complementary foods should be considered in the larger framework of food beliefs. For example, foods that are considered taboos in a society are probably not given to children either. Moreover, children's diet is influenced by the culture's cuisine (Dettwyler & Fishman 1992), and also by household meals and family eating behaviours (Paul et al. 2011, Messer 1997). For example, in Zimbabwe cultural beliefs prevented cooking vegetables with fish stew when a vital ingredient, coconut, was not available (Paul et al. 2011). Mothers reported that children ate vegetables whenever families ate them, but consumption was in fact rare, because coconut was seldom available.

However, complementary foods can sometimes be regarded as especially suitable (or harmful) for young children. Beliefs may exist about the foods considered to be healthy or unhealthy for young children, the child's perceived ability to eat certain foods, about the suitable food preparation methods, the introduction of complementary foods and the feeding method, to name a few (Paul et al. 2011, Dettwyler 1986). A synthesis of beliefs reported in the literature that influence the introduction of first complementary foods and complementary food choices in general is presented in table 1.

Beliefs related to introduction of complementary foods

Beliefs about the appropriate time of introduction of complementary foods vary across cultures (Engle et al. 1997). As presented in table 1, common reasons for starting complementary feeding, are perceived breast milk insufficiency, particular developmental milestones the child achieves or the characteristics of the child.

Perceived breast milk insufficiency is often the most common reason for early introduction of complementary foods. Mothers often evaluate this based on child's crying (Kerr et al. 2007, Engle et al. 1997, Cosminsky et al. 1993). The interpretation is often that the baby's "stomach is growing" and breast milk is no longer sufficient (Mabilia 1996). Mothers also make the decisions to start complementary feeding based on child's perceived appetite (Bentley et al. 1999, Bentley et al. 1991). Good appetite of the child is often seen as a sign of good health or as a need to have more food.

Table 1: Beliefs related to infant and child feeding

	Belief	Cited in
Beliefs related to timing of first foods	Perceived breast milk insufficiency	Rasheed et al. 2011, Kerr et al. 2007, Sellen 2001, Engle et al. 1997, Cosminsky et al. 1993, Mabilia 1996
	Child's appetite	Bentley et al. 1999 and 1991
	Development of teeth	Monterrosa et al. 2012, Sellen 2001, Harrison et al. 1993, Dettwyler 1986
	Child's motor development	Sellen 2001, Harrison et al. 1993, Dettwyler 1986
	Hand and body gestures	Monterrosa et al. 2012
	Child is old enough	Sellen 2001
	Child is too skinny	Lindsay et al. 2008, Bentley et al. 1999, Simondon & Simondon 1995
	Child wants to eat	Dettwyler 1986
	Reduces time spent on breastfeeding	Sellen 2001, Harrison et al. 1993
	Food calms the child	Bentley et al. 1999
	Another pregnancy	Hampshire et al. 2009
Beliefs related to comple-mentary food choices	Foods are "light" or "heavy"	Lindsay et al. 2008, Bentley et al. 1991, Dettwyler 1986
	Soft foods are good/ hard foods are bad for children	Monterrosa et al. 2012, Paul et al. 2011, Cosminsky et al. 1993, Bentley et al. 1991
	Children are not able to chew or swallow certain foods	Cosminsky et al. 1993, Paul et al. 2011, Bentley et al. 1991
	Dietary taboos	Lindsay et al. 2008, Ogbeide 1974
	Children like certain foods	Monterrosa et al. 2012, Pelto & Armar-Klemesu 2011
	Children's and adults' foods should be prepared separately	Monterrosa et al. 2012, Kruger & Gericke 2002
	Children do not need own foods	Rasheed et al. 2011, Bentley et al. 1999
Beliefs related to consequences of foods	Delays growth and development	Paul et al. 2011, Dettwyler 1986
	Is good for health	Monterrosa et al. 2012, Pelto & Armar-Klemesu 2011, Dettwyler 1986
	Causes diarrhoea, worm infection or other diseases	Paul et al. 2011, Cosminsky et al. 1993
	Promotes growth	Harrison et al. 1993
	Protects children	Kerr et al. 2007

The process of complementary feeding and the further transition to family foods is often started based on child's development, for example when a child develops teeth or starts walking (Sellen 2001, Harrison et al. 1993). For example, Tanzanian mothers believed children should reach a certain degree of competency before receiving stiff maize porridge (Sellen 2001). Indication of this competence was achieving certain milestones, such as walking or becoming "big enough". The same was reported in rural Mali (Dettwyler 1986). However, in this anthropological study, eating solid foods was considered another step towards adulthood, not necessarily related to child's needs. Malian mothers in the study also believed that complementary foods should be given when children themselves want to eat them.

An ethnographic study conducted in Mexico revealed that the presence of teeth and certain hand and body gestures were cues for mothers to start giving their children solid foods (Monterrosa et al. 2012). Besides gestures, also child's physical appearance can have an impact on the decision to start complementary feeding. African-American low-income women introduced solid foods, if the child was considered "too skinny" (Bentley et al. 1999). The same was reported in Brazil (Lindsay et al. 2008) and in rural Senegal (Simondon & Simondon 1995). Moreover, in Egypt supplemental liquids and foods were believed to promote growth and fatness (Harrison et al. 1993).

Some foods are thought to be necessary for small children because they protect them from "evil" or illness. In Malawi, grandmothers gave children *mzuwula* an herbal infusion made of leaves of a local tree. It was believed to "protect" the child from illnesses that were believed to be caused by "promiscuity" of the parents or in some cases, by anyone in the village (Kerr et al. 2007). Nearly half of the children in the study were given this infusion already in their first month.

Early supplementation of infant's diet with liquids and foods may be started because it decreases the time mothers have to spend on breastfeeding (Harrison et al. 1993). A study among low-income mothers in the United States revealed that mothers weaned children already during the first month of life with cereal in the bottle. Mothers reported that it calmed children and allowed them to sleep better (Bentley et al. 1999).

A new pregnancy may also be a reason to start complementary feeding. In a qualitative study made in Niger, it was noted that mothers started complementary feeding as a precaution in case they would get pregnant, so that their children would already be used to eating complementary

foods (Hampshire et al. 2009). Breastfeeding during pregnancy was against the norm, because there was a belief that the breastfed child steals milk from its unborn sibling. Pregnant women's milk was also considered to be potentially harmful for the child, causing illness or even death.

Beliefs related to children's ability to eat foods

Many ethnographic or anthropological studies have reported beliefs concerning child's ability to eat certain foods (Monterrosa et al. 2012, Paul et al. 2011, Cosminsky et al. 1993, Bentley et al. 1991). These beliefs are usually connected to the structure of foods or the child's perceived capability to chew certain foods, such as meat.

Caregivers may prefer giving children soft and liquid foods since they are considered to be most suitable for young children. Monterrosa et al. (2012) described how Mexican mothers in their study mostly fed their children liquid and semi-liquid foods with few vegetables, meats and legumes. Mothers made the decisions of appropriate first foods based on their consistency. Soft foods such as yogurt and puddings were preferred. Soft foods were also favoured by Zimbabwean mothers (Cosminsky et al. 1993). Mothers considered porridge, bananas, oranges, soup and peanut butter to be especially good for children. These foods were said to be "good for body building and energy".

On the other hand, foods that were considered unsuitable for children in Zimbabwe were those that were hard to chew, such as boiled maize, dried vegetables and meat (Cosminsky et al. 1993). These foods were believed to cause diarrhoea. Another more recent study in Zimbabwe (Paul et al. 2011) had similar findings: mothers were afraid that babies would choke on foods that are hard to chew, such as beans, insects and hard cereals and fruits. Hard foods were avoided also in Nigeria (Bentley et al. 1991) because mothers believed that they were impossible for the child to chew. In Mexico beef and chicken were not offered until the second year of life, until children had several teeth (Monterrosa et al. 2012).

Sometimes children are not fed special complementary foods at all, because they move almost directly to adult diet (Bentley et al. 1999). Bentley et al. described how low-income, African-American women distinguished between their own and their baby's food needs merely by quantity. Mothers believed that infants were able to eat the same foods as adults almost right from birth. Similar results were found in Bangladesh (Rasheed et al. 2011). Mothers lacked

knowledge of children's requirements for food quantity, the nutritional needs of young children and their capacity to chew and swallow. This led to the use of thin, starchy gruels followed by a direct transition to family foods.

Only few studies have shown mothers to specifically express that separate foods should be cooked for children because of chili or other strong spices (Monterrosa et al. 2012) or because of cultural beliefs (Kruger & Gericke 2002). Therefore, as shown in the abovementioned studies, mothers may lack knowledge of how to prepare complementary foods that would be more suitable for children to eat. This may lead to monotonous diets without meat, beans or other foods that mothers consider "hard". At the age of six months, children are well able to eat for example meat, provided that it is well cooked and mashed.

Beliefs related to the effect of foods on children's health and development

Several studies have described how mothers make decisions about what foods are suitable for young children based on the consequences of their consumption. Foods may be considered to be good for health and growth or to cause various diseases.

Pelto and Armar-Klemesu (2011) studied complementary feeding behaviours of urban Ghanaian women. They found that cost, nurturance and time were the most important factors influencing complementary feeding. Pelto and Armar-Klemesu describe nurturance as a complex set of beliefs and practices that aim to improve health, well-being and development of children. Despite their low level of education, the participants could easily rank foods by their perceived healthiness. Women used terms such as "nutritious" and "high in vitamins" when describing the qualities of foods. Many of the beliefs mothers had were closely allied to contemporary nutrition and public health knowledge, even though some women were illiterate and many of them had no or only some schooling (Pelto & Armar-Klemesu 2011).

Also South African mothers gave medical explanations when describing the perceived benefits of certain foods (Krueger & Gericke 2003). However, according to the researches, mothers were uninformed about what foods were nutritious and why, and they used medical and nutritional terminology without knowing their actual meaning. Mexican mothers gave health attributes to foods as well. They considered vegetables, fruits, breast milk and probiotic beverages "positive"

and healthy, whereas junk food, carbonated beverages, beans, oil and pork were thought have a negative effect on health (Monterrosa et al. 2012).

Foods may also be given negative attributes. In traditional cultures, some foods may be considered taboos. One popular example is from West Africa: in a study conducted in mid-west Nigeria it was reported that meats and eggs were not given to children because parents believed they would make their children steal (Ogbeide 1974). Parents explained that children would get used to eating these foods, but could only obtain them by stealing because they could not later afford to buy them.

Cultural beliefs and taboos have also been found to influence low-income Brazilian mothers' feeding behaviour (Lindsay et al. 2008). They were, for example, reluctant to give their children bananas and mangoes, especially during the night, because they were considered to be "heavy" and cause illness. "Heavy" foods were also referred to in a study by Bentley et al. (1991). Nigerian mothers believed that breast milk and local porridge were sufficient for the first year of the child's life. Mothers believed that an earlier introduction of "heavy" solid foods would result in the child becoming "heavy". A "light" child is one, who is light to pick up, who is active and not ill.

According to a study carried out in rural Mali, there was a general belief that foods, such as rice and millet, were not appropriate for young children (Dettwyler 1986). According to the respondents, giving these foods to children too early would cause illnesses, choking and trouble with digestion, and delayed growth and walking. In Pemba, Tanzania, mothers did not give locally available fish to children, because they believed it would cause tooth decay or worm infections (Paul et al. 2011). Moreover, in South Africa, caregivers believed that starch-rich foods (excluding maize porridge) or fat should not be given to small children as it was considered overall unsuitable (Kruger & Gericke 2003).

Despite these examples, there is a limited amount of literature concerning food taboos' actual effect on child health and nutritional status, and whether these beliefs are nowadays still followed.

Beliefs related to the characteristics of the child

As research cited above shows, child's characteristics, such as appetite, development and growth, may have an important effect on feeding practices. Wachs (2008) proposes that these

characteristics should be included in the care framework. He discusses the influence of child's temperament, gender, age and rate of physical growth and on nutrition. For the last three determinants research has shown variable results. Results concerning effect of temperament have however been very interesting. The reactivity and self-regulation of the child has been shown to influence nutrition outcomes (deVries 1984). For example fussy-intense children are more likely to survive in case of food scarcity compared to children with a more placid temperament.

The behaviour of the child was found to have an influence on how much children ate in an ethnographic study in Mali by Kathryn Dettwyler (1986, 1987). Mothers believed children themselves would know how much to eat. They also believed that children would stop, when full. Therefore, child's hunger or interest in food determined the amount of food that was provided. Children were not encouraged or forced to eat and they were expected to eat by themselves from very early age. By combining both qualitative and quantitative methodologies, Dettwyler showed that children of attentive mothers had better growth than children of inattentive mothers.

Child's food preferences are seldom discussed in studies about complementary feeding in the developing world. Few examples do, however, exist. Pelto and Armar-Klemesu (2011) explained in their study carried out in Ghana that mothers frequently make changes in foods they offer to children if the child rejects or refuses to eat them (Pelto & Armar-Klemesu 2011). Also mothers in Mexico observed child preferences and gave them foods that they seemed to like (Monterrosa et al. 2012).

Relationship between belief and practice

It should be kept in mind that maternal knowledge or beliefs are not static and unchanging. They are not similarly held by everyone, not even by people living in the same community. Furthermore, the relationship between belief and practice is often not clear. Research has shown that mothers often "bend the rules", and beliefs and practices can be subject to negotiation (Hampshire et al. 2009). Often mothers will describe cultural beliefs when asked about them, but in reality they behave differently. For example, in rural Zimbabwe mothers had practical and pragmatic reasons for the choice of complementary foods even though many food-related beliefs were reported (Cosminsky et al. 1993). Mothers' pragmatic attitudes interacted with social, cultural and economic variables. For instance, maize was preferred for the preparation of porridge for children, because grinding of millet and sorghum took more time and energy.

Sometimes adherence to cultural practices can worsen child nutrition (Kruger & Gericke 2003), but indigenous knowledge should not be regarded only as harmful. According to Pelto et al. (2003) some of the beliefs, knowledge and perceptions are positive with respect to current scientific knowledge, some are neutral, and some can be regarded as counterproductive from the perspective of contemporary biomedical and scientific understanding. Moreover, Paul et al. (2011) emphasize that mothers' indigenous knowledge of child care and food should not be disregarded. Instead, educational messages "should be grounded in the sociocultural source of complementary feeding problems". For example, telling mothers that beans should be given to children daily disregards the mothers fear that the child will choke on them.

Finally, it should be noted that besides the primary caregiver of the child, these sometimes strong beliefs are often shared by other persons too, such as the spouse, grandmothers, mothers-in-law and other community members, who also influence child feeding and complementary food choices (Fouts & Brookshire 2009, Kerr et al. 2007). Moreover, their knowledge of feeding is diffused to caregivers when they seek for help and support. The influence of other family members on complementary food and feeding choices is discussed in the next section.

2.2.3 Household context

In this section I will discuss household level factors that influence child feeding. I have included here maternal time constraints, social support for caregivers, control of resources, decision-making about food purchasing and child care and finally distribution of food within a household.

Mothers' time constraints and employment

In addition to child care, mothers are generally engaged in other time-consuming domestic activities, such as cooking, cleaning, fetching water and farming (Engle et al. 1997). However, the idea of mothers as a domestic homemaker is becoming increasingly rare, as in most societies a large proportion of women engage themselves in some form of income-generating activities (Pelto et al. 2003).

Mothers' work outside home can impair child's nutrition, especially when the child is very young. The influence of mothers' employment on breastfeeding has been extensively studied (Engle et al. 1997). Work outside the home can shorten the duration of exclusive breastfeeding and breastfeeding in general. For example, Paul et al. (2011) found that Tanzanian mothers started to

work in the fields only two to four months after labour. In order to be able to leave for work, they would bottle-feed their young infants with thin porridge. Thus maternal employment can cause complementary feeding to be started earlier.

The studies of associations between women's employment and child nutritional status are controversial. Employment of mothers may yield more income for the household to use for food and care (Engle et al. 1997). However, in some cases high maternal workload, including many household duties and work outside the house, has had a negative effect on nutritional outcomes (Abubakar et al. 2011, Kulwa et al. 2006). Furthermore, the limited time that mothers have for preparing food and feeding children may often result in women selecting easy-to-prepare complementary foods (Pelto et al. 2003). They may change traditional cooking-techniques to ones that are less time-consuming. Mothers' may also feed their child quickly or less often to save time.

When considering the effect of mothers' workload and the time she has available for child care, one must also consider the availability and quality of alternative caregiving systems, the age of the child, the women's wages and their control over earned income, the flexibility of work and the poverty of the household (Engle et al. 1997). Thus, the question is not simply about the lack of time, but about time in relation to other activities, responsibilities and demands that women may have.

Social support for caregivers and decision-making about child feeding

Pelto et al. (2003) argue that "feeding infants is a family affair". The influence of spouses, friends and the older generation on breastfeeding has been extensively researched in the past two decades. The significance of family on complementary feeding has been less explored. Compared to breastfeeding, complementary feeding is more of a family responsibility, and not something provided only by the mother for free (Piwoz et al. 2003). Even though mothers usually prepare the food for children, other people such as fathers, grandmothers, cousins, aunts, siblings and other community members are often involved in the feeding process, either directly or indirectly (Pelto et al. 2003).

The social support network can provide support in many ways. Firstly providing emotional support, love and acceptance, and secondly through instrumental assistance such as information,

advice and help with child care (Harkness & Super 1994). In addition, the people surrounding caregiver may set social expectations that guide "appropriate behaviour". The social support system of alternate care during primary caregiver's absence is especially important for complementary feeding (Engle et al. 1997).

The influence of grandmothers has been reported to be important in many settings (Aubel 2012, Fouts & Brookshire 2009, Bezner et al. 2008, Lindsay et al. 2008, Kerr et al. 2007, Aubel et al. 2004, Bentley et al. 1999). In many traditional societies, the older generation and grandparents have a strong position in extended families and in the community in general. Grandmothers are involved in decisions about children's diets and feeding practices, in addition to decision about food purchasing and cooking. Grandmothers are often seen as the "guardians of traditions" who seek to maintain the indigenous ways of childcare. For example, in Malawi grandmothers had an influence on the early introduction of traditional root infusions and porridge, thus shortening the period of exclusive breastfeeding (Kerr et al. 2007). Moreover, younger women had very limited decision-making control over different care practices.

The relationship between healthcare professionals and grandmothers has sometimes been challenging. Grandmothers of low-income, African-American adolescent mothers objected to the health professionals' advice to delay introduction of solid foods, preferring to introduce cereal and other solid foods already within the first month of the child's life (Bentley et al. 1999). In Malawi, hospital staff and other healthcare workers viewed grandmothers' traditional knowledge as backward, disregarding their importance in the communities (Kerr et al. 2007).

Despite the commonly given role as the "guardians of tradition", the older generation may be willing to learn and adopt new ideas, as was shown in an intervention study in Senegal (Aubel et al. 2004). The intervention in rural villages proved to be very successful when grandmothers were included in the participatory communication education activities, such as group discussions. These activities improved grandmothers' knowledge of the issue, and a year later, results showed that this had had a positive effect on child feeding practices of the younger generation. These promising results support the need to include the older generation in education and communication activities

In addition to grandparents, other members of the extended family may also help with child care. An observation study in Congo noted that the combined contribution from other caregivers

(fathers, grandmothers, siblings, aunts and cousins) was in total higher than the contribution from primary caregivers, mothers (Fouts & Brookshire 2009). Surprisingly, adolescent relatives, cousins and siblings provided food for the child as often as adult female relatives and nearly as often as elderly female relatives.

Fathers' role in complementary feeding has not been studied extensively. In traditional non-Western societies, the father is often seen as "the head of the household" who makes the decisions about day-to-day matters. However, a review by Judi Aubel (2012) suggests that men do not have lot of decision-making power over child care and nutrition, because they lack experience in this domain According to Aubel, on the micro-level of the household, the older women are the leading authorities. The studies cited in the review suggest men are *advisees* rather than *advisors*, since senior women both advice and make demands on their sons and sons-in-law (Aubel 2012).

Even though fathers might not make daily decisions about child care and feeding, they are an important source of emotional and informational support for mothers. It can be seen in studies regarding the promotion of breastfeeding that successful programs have included fathers and other non-maternal caregivers into the activities (Piwoz et al. 2003). Furthermore, fathers are also important source of economic support which is further discussed in the next section.

Control of resources and women's income

Previous studies have found female income to be a predictor of better child nutrition (Brunson et al. 2009). Women are often more likely to invest in the basic food and healthcare needs of their children, and they also prioritise these needs above other needs. Men in contrast invest more often in themselves or in the worth of their households. Men and women may therefore have conflicting priorities concerning the use of resource within the household. There is some evidence that when men provide a higher percentage of their incomes to the family, their children are better nourished (Engle 1993).

Thus, even though child feeding is in many cultures the task of women, men can indirectly contribute to complementary feeding decision through controlling household cash and food purchasing (Mwangome et al. 2010). Moreover, sometimes also the task of food purchasing is allocated to men, limiting the control women have over food choices (Rasheed et al. 2011). In

addition to husbands, also grandparents may have power over the decisions on what is bought for the household, as was seen in Kenya (Abubakar et al. 2011).

Therefore, in some societies, women might not have the power to use the household's wealth as they wish. Mothers' adequate knowledge of appropriate care may have only a minor impact on actual practices, if their partners are not informed as well. In a focus group study in Kenya, mothers specifically said that because their husbands did not participate in nutritional counselling sessions, they would not be willing to invest in nutritious foods for their children (Abubakar et al. 2011). Mothers' education may, however, increase their bargaining power, as better educated women may be more able to negotiate for more money from their husbands to improve children's diets (Pfeiffer et al. 2001).

Improving the ways that women earn income is one possible way to improve children's diets. Pfeiffer et al. (2001) found in a case-control study in Mozambique that mothers were able to choose how to spend their earnings, if they earned more than what was required for daily household needs. Mother's income was often insufficient to meet the most basic nutritional needs of the family, or to purchase animal source foods, and thus mothers were dependent on small allowances given by their husbands. Pfeiffer argues that in economically homogenous subsistence communities, household's access to even small amounts of money can have a great effect on child nutrition and health.

Women's autonomy and male labour migration

The effect of women's autonomy on child nutrition is less clear than the effect of their income. Women often enjoy more autonomy in female-headed households, even though these households often have a lower income (Brunson et al. 2009, Onyango et al. 1994). It is probable that the intra-household distribution of food favours children under these conditions. For example, in Kenya children of female-headed households had more variety in their diets (Onyango et al. 1994). However, in the statistical analysis the sex of the head the household was not related to nutritional status.

Children's age may determine whether the sex of the head of the household has an influence on their nutrition status. Brunson et al. (2009) found that in nomadic pastoral Kenyan community, women's autonomy had an effect on elder children's nutrition (3 to 10 years) but not on younger

children's (0 to 35 months). The researchers speculate that younger children are not as vulnerable to shortages of food, since a large share of their nutriments comes from breast milk. They also note that women's autonomy was more important when resources were scarce.

Rural exodus, especially male labour migration, is common in many countries. Emigration can be an important means of supplementing household income. However, it causes a shift in the intra-household power relations and decision-making (Hampshire et al. 2009). Some women may gain more control over resources when their husbands are absent. Sometimes the decision-making is delegated to another family member or member of the community.

There has not been much research on how male labour migration affects the health of the children left behind. One study from Mozambique revealed that even though labour migration may enhance the economic situation of the family, the impact on children's mortality depends more on the successfulness of the migration (Yabiku et al. 2012). The "successfulness" was investigated by asking mothers, whether they thought their living condition had improved after their husband left to work elsewhere. The research showed that children of successful migrants had the lowest mortality. The researchers hypnotized that unsuccessful migration may increase mother's work burden and lead to economic and emotional stress.

Intra-household food distribution

While the decisions on what is bought for the household may influence children's diet, the decision of food distribution within the household can also have a tremendous impact. Research has shown that in many communities household food security does not necessarily mean adequate diet for all its members (Messer 1997).

Some anthropologists argue that the lower quality of foods that children get is not intentional but merely routine behaviour that is associated with the serving order and the way some household members are denied certain foods (Messer 1997). For example an anthropological study made in Niger reported that men were served first and they typically got the best parts, such as meat (Hampshire et al. 2009). Children over the age of one ate from a shared plate, separately from adults and leaving parents thus unaware of how much each child ate

Food distribution patterns within a household might also be based on nutritional beliefs concerning, for example, the relationships between foods and health and development (Messer

1997). As described in previous sections these beliefs affect food choices, and some foods may be perceived as altogether unsuitable for children to eat.

2.2.4 Community context

In this section I will briefly describe the complementary feeding determinants on the community level: these including poverty, agriculture and healthcare services.

Poverty

It is well known that poverty increases undernutrition. This can be seen in disparities between stunting prevalence and wealth strata (Bhutta et al. 2013). Stunting prevalence among children under the age of 5 was 2.5 times higher in the poorest quintile of households than in the richest quintile (Black et al. 2013). Several studies show that lack of money and high food costs prevent families buying higher-quality foods (Monterrosa et al. 2012, Hampshire et al. 2009).

Besides limiting the access to adequate and appropriate food, poverty can constrain the access to healthcare services, increase maternal workload and in many ways influence the more proximal determinants of nutrition and growth (Stewart et al. 2013). Furthermore, caregivers may not be able to make recommended complementary food choices, if the community infrastructure is impaired by poverty. For example, poor road conditions restrict the access to markets and inadequate access to clean water jeopardises the safety of complementary foods

However, evidence from studies around the world has shown that providing adequate food or income for the community or for the household does not necessarily mean better diet and nutrition for young children (Dettwyler & Fishman 1992). On the other hand, while poverty increases susceptibility to poor nutritional outcomes, a significant number of children brought up in poverty thrive. A concept of "positive deviance" has been developed meaning the ability of some caregivers to raise and nourish their children well in communities with high rates of poverty and malnutrition. These "positive deviants" have adopted care practices that allow for good diet and health with limited resources (Berggren & Wray 2002). Research suggests that attitudes, beliefs, knowledge and practices related to child care are perhaps more important factors defining good care outcomes, rather than the economic status of households (Appoh & Krekling 2005).

Healthcare

Health facilities play an important role in the screening of inadequate growth and development but also as a source of guidance and information. In many developing countries, community based health clinics and health workers are a commonly used platform for nutrition interventions (Bhutta et al. 2013). For example, a randomised community study in Peru showed that healthcare workers have an important role on child feeding practices (Penny et al. 2005). However, health facilities are often burdened with other tasks and lack qualified staff, and thus may not be able to provide adequate child feeding counselling (Stewart et al. 2013).

Agriculture

The agricultural sector interacts with other contextual factors, such as the environment and economy, affecting the availability and access to food (Stewart et al. 2013). For example, seasons can have a great impact on the availability of complementary foods. In a study among seminomadic rural pastoral population in Tanzania it was noticed that weaning patterns were strongly influenced by seasonal factors (Sellen 2001). Introduction of solid foods and cessation of breastfeeding occurred more commonly after rainy periods when animal milk and maize became more available.

Improving agricultural practices could also improve children's diets. Several reviews have described the relationship between agriculture, food system and nutrition, although only a few have focused on complementary foods (see for example Masset et al. 2012). Agricultural interventions have been successful in promoting consumption of foods rich in protein and micronutrients, but the effect on diet and growth has remained unclear. This might be because of methodological weaknesses in the reviewed studies.

Globally, there are efforts to improve the complementary foods of young children by enhancing the biodiversity of diets and increasing the use of indigenous foods and biofortificated crops (Stewart et al. 2013). Another area of agriculture that has a promising impact on growth of young children is small livestock development. Milk, eggs, fish and insects are nutrient-rich foods, while being relatively feasible for rural population with low incomes to obtain. However, behaviour change component need to be connected to these agricultural actions, to ensure that high-quality foods are actually fed to children. As agriculture is a livelihood for large proportion of rural

population, families may prefer to sell the foods they produce, rather than give them to their children. For example in Tanzania children's fruit intake was poor even during mango season, because mangoes were important source of additional income for families (Paul et al. 2011).

2.3 Conclusion of the literature review

The period of complementary feeding is a crucial window of opportunity to decrease the disease burden caused by poor feeding practices. The literature cited here have shown that complementary feeding practices are influenced by multiple context-specific determinants from mothers' knowledge, skills and time-constraints to factors at the household and community level.

Most of the studies concerning factors influencing complementary feeding concentrate only on one or two determinants. Studies that aim to describe multiple factors influencing feeding choices and practices are limited. However, a few recent and interesting examples do exist, which have attempted to give a comprehensive view of the complex issue of complementary feeding (e.g. Monterrosa et al. 2012, Paul et al. 2011, Pelto & Armar-Klemesu 2011).

As described previously, studies regarding complementary feeding in Benin are limited. There is a clear need to investigate factors influencing caregivers' complementary food and feeding choices in Benin. Furthermore, more research is needed on the local barriers that prevent caregivers from feeding their children according to the WHO recommendations.

3. AIM OF THE STUDY

The aim of this study was to identify mothers' reasons for current complementary feeding practices of 6 to 24-month-old children in two villages of Mono department in Southern Benin.

Specific research questions:

1. What are the current feeding practices in the villages?
2. What kind of knowledge, perceptions and beliefs do mothers have about complementary feeding?
3. How does household and community context influence complementary feeding practices?

The present study was carried out in the preliminary phase of a larger research project that is a part of the FoodAfrica research collaboration funded by the Ministry for Foreign Affairs of Finland. The partners in the project are Bioversity International, University Abomey Calavi in Benin and University of Helsinki. The larger research project aims to investigate links between agrobiodiversity, dietary diversity and nutritional status of young children in Benin by focusing on complementary foods for 6 to 24-month-old children. The purpose of the preliminary phase was to improve understanding of complementary feeding practices, and of the attitudes and beliefs related to feeding of young children. The University of Abomey Calavi gave the ethical approval for this study.

4. RESEARCH LOCATION

4.1 Benin

Benin is located on West African coast, and it has a total population of 9.9 million. Statistics of Benin and its development are presented in table 2. Benin is classified as a low-income country and poverty is common; nearly half of the population live with less than 1.25 dollars per day (World Bank 2013). Benin has enjoyed democratic government since the end of the Marxist-Leninist regime in 1989. In the Human Development Index the country is ranked 167th out of 187.

Table 2: Statistics and indicators of development in Benin

Population (millions, 2013)	9.9
Area (km2)	112 622
Gross national income (GNI) per capita at purchasing power parity (USD 2011)	1 630
Proportion of rural population (% 2011)	55
Life expectancy at birth (years, 2011)	59
Estimated adult (15–49 years) HIV prevalence (% 2011)	1.2
Under-5 mortality rate (per 1 000 live births, 2011)	106
Wasting (% of under-fives, 2011)	8
Stunting (% of under-fives, 2011)	43
Maternal mortality ratio (per 100 000 live births, 2010)	350
Population below poverty line of USD 1.25 per day (% 2011)	47
Improved water source, rural (% of rural population with access, 2011)	69
Total adult literacy rate (% 2010)	42
Primary school net enrolment ratio (% 2012)	95

Sources: UNICEF country statistics 2014, World Bank 2013 and CIA World Factbook 2014

Benin has several ethnicities and over fifty languages are spoken, of which French is the official language. According to a census made in 2002, nearly half of the population are Christians (46 %) (CIA World Factbook 2014). The Muslim population (24 %) lives mainly in the northern parts of the country. Also traditional religions, such as Voodoo (17 %) are commonly practiced, often beside other religions.

The country is located in the tropical zone; the south is hot and humid and north is semiarid (CIA World Factbook 2014). There are two rainy and two dry seasons. The economy relies heavily on the agricultural sector, which accounts over one-third of the gross domestic product

and is the source of livelihood for 70 percent of the workforce. The most exported commodity is cotton. Benin is relatively self-sufficient in cereals and starchy roots, but is heavily dependent on imports of foods of animal origin (FAO 2011). In 2011 it was estimated that nearly one-fourth of the population was food insecure (MDAEP & INSAE 2012). According to the World Food Program, food and nutrition insecurity is caused by structural problems in the agricultural sector, such as poor soil condition, lack of modern farming technologies, and insufficient storage, processing and preservation infrastructure (WFP 2013). Furthermore, climate change and natural disasters, together with the global financial crisis and increased food prices, have deteriorated food security in the most vulnerable areas of the country.

Benin is most likely going to meet the Millennium Development Goals (MDGs) for eradicating hunger, improving access to safe drinking water in rural areas and reducing HIV/AIDS prevalence (World Bank 2013). Achieving the other MDGs remains a challenge. Child and maternal mortality remain very high: under-5-mortality is nearly 11 %. However, Benin is one of the few sub-Saharan countries where childhood mortality has declined in the last few decades (Rutstein et al. 2009). The increase in possession of bed nets has been important factor behind this success. On the other hand, the goal of improving the access to basic sanitation is not likely to be met. Equality in primary and secondary education has also not actualised as boys attend school more often than girls (World Bank 2013).

4.2 The study area

The department of Mono was selected as location for the research project because of its high level of biodiversity. According to the DHS statistics, indicators of infant and young child feeding practices and the prevalence of stunting in the department of Mono are roughly similar to the national averages (INSAE & ICF International 2013).

The department of Mono is situated in the southwest part of Benin (Figure 2). The capital of the department is Lokossa, which is located about 100 kilometres from the economic capital Cotonou. The area of Mono is 1 605 km² with a population of 495 000 (INSAE 2013). Approximately 38 % of the population live in urban areas. Most practiced religions are voodoo (41 %) and other traditional religions (14 %), and approximately one-fifth of the population is Catholic. The department consists of six communes and 275 villages (INSAE 2004).

The larger research project is going to be conducted in three communes of the department. This preliminary phase was carried out in two of those communes, Bopa (pop. 97 000) and Houéyogbé (pop. 101 000) (INSAE 2013). They represent different agroecological zones of Mono and thus different livelihood strategies. The agroecological zone of Houéyogbé is called "the red soil". The soil is very easy to work with, and it is suitable for cultivation of different crops. The zone of Bopa is called the "wet low lands", and it is characterized by vegetation such as grassland, swamps and mangroves.

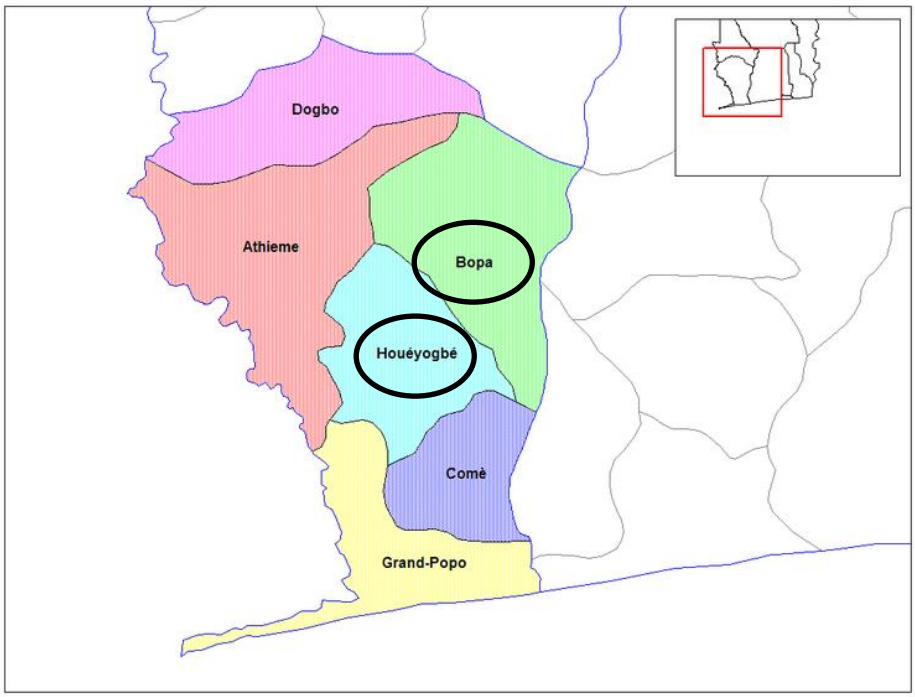

Figure 2: The department of Mono, study communes are circled. (Source: Wikipedia 2013)

Two villages, one from each commune were purposefully chosen for the preliminary study with the assistance of a local non-governmental organization (NGO). They villages are located in different agro-ecological zones; Sohounmè in the zone of "red soil" and Akotomey in the "wet low lands".

The villages were chosen for the study because of two reasons. Firstly, the availability of health services is different in the two villages. The clinic in Sohounmè is no longer in function, and health services are located at a further distance. Akotomey, on the other hand, has three clinics relatively close by, but not in the village itself. Secondly, the composition of houses in the villages

is different; Sohounmè is very compact in contrast to Akotomey which is spread out over a wider area and is actually formed out of four sub-villages.

The following information about the villages and their inhabitants was collected in interviews with women and healthcare workers, and meetings with village leaders and other pivotal decision-makers, including village elders and a shaman.

4.2.1 Sohounmè

The population of Sohounmè was 965 habitants in 183 households, according to the census made in 2002 (INSAE 2004). The average size of a household was 5.3 persons and the total number of children under the age of five was 165. The figures from census of 2013 were not available at the time of writing. There are several different ethnicities in the village. Languages spoken in the village are *Fon*, *Kotafon*, *Mina*, *Sahoue* and some understand French. Most people practice some form of Christianity and others practice traditional religions, such as voodoo.

The main livelihood for inhabitants is agriculture, most cultivated crops being maize, cassava and beans. Peanuts, chili peppers, red palm oil nuts, tomatoes, yams, bananas, sugar canes and sweet potatoes are also cultivated. Cultivated leafy vegetables include bush okra (*Cochorus olitorius,* Fr. *craincrain*) and African eggplant (*Solanum macrocarpon,* Fr. *gboman*). Main livestock in the village are chickens, goats, pigs and ducks. Some men practice fishing in the surrounding lakes. Village leaders also mentioned that some people hunt bush chicken, rabbit, agouti and bush pig.

Many women practice some commerce, selling rice, beans, fermented maize porridge (Fr. *akassa*), cassava flour (Fr. *gari*), red palm nut oil and charcoal from their homes and on the village market. Some women also work in a stone mine nearby. In addition to the household's own food production, foods are purchased from the village and the Sè and Comè markets which are held every five days. Some people also go to Lokossa, the main city of the department.

Sanitation facilities are not available to everybody in the village. Most of the people go to the "bush". There are some public pit latrines in the village school and in the health centre, but they were locked and thus not available to all. Source of water for almost all is a public tap in the village, but it does not function properly and taking water takes a lot of time. Some fetch water from the surrounding lakes or they have their own wells.

As said before, the village is far away from health services. The closest health centres are about eight kilometres away. The road to the village is in a bad condition and it is not uncommon that it is broken during rainy season. People are forced to walk or take a motorbike taxi to the clinics, since there are no public transportation

4.2.2 Akotomey

Akotomey consists of five hamlets or sub-villages: Akotomey, Djakahonou, Sakpatonou, Tohonou and Gnongnonvihoué. Akotomey is the main hamlet of the village. Tohonou is actually a village of its own, but part of it belongs to Akotomey. The population statistics of Akotomey are not available. There are three main ethnicities or tribes, but all the inhabitants speak *Sahoue.*

Farming is the main activity. Most cultivated crop is maize followed by cassava. Also beans, peanuts, chili peppers, African eggplant (*Solanum macrocarpon*), okra and bush okra (*Cochorus olitoriu*s) are cultivated. Most common livestock are chickens and goats. Some people also have guinea fowls and pigs. In Tohonou people also fish and grow fish in the lake nearby. Agouti, rabbits and wild guinea fowl are hunted in the dry season. People buy food from the Logoba market, which is about ten kilometres away. Some cultivated crops and snacks are also sold in the village, but there is no common village market as there is in Sohounmè.

The habitants of Akotomey also practice other agro-business activities. They cook palm oil and cassava flour and make traditional alcohol. Some collect straw that is used for making traditional carpets. Women's main activities are making of cassava flour and fermented maize porridge.

Sanitation facilities are not widely available. In Tohounou there are some public pit latrines, but according to the interviewed mothers they are not functioning, and most of them have to go to the "bush". Three of the hamlets have public taps that are maintained by the government or an NGO. People living in the Djakahonou hamlet have to walk to other hamlets to fetch water, which cost 10 to 15 francs for 25 litres (2 to 4 euro cents). There is a privately owned primary school in the village that is free for pupils. There is no health centre in Akotomey, but are three relatively close by.

5. METHODOLOGY

5.1 Rationale for using qualitative methods

Qualitative research seeks to describe and analyse the culture and behaviour of humans from the participants' point of view (Hudelson 1994). It aims to obtain a comprehensive understanding of the context and the social setting where behaviour occurs (Carter & Henderson 2005). Qualitative research methods and strategies are flexible and iterative, meaning that research questions can be changed or altered during the course of study (Hudelson 1994). This flexible approach may help discover unexpectedly important topics.

Qualitative methodology is useful in exploratory research, when the issue has not been researched previously or the subject is unfamiliar (Hudelson 1994). To my knowledge, no qualitative studies on complementary feeding have been conducted in Benin. As information on feeding practices and their determinants is limited, survey studies or other quantitative approaches cannot be effectively used.

The data for this study was collected in focus group discussions and individual interviews. I will now describe the rationale for these methodologies, and the development of the study tools.

5.1.1 Focus group discussions

Focus group discussions were chosen as the method for this study, because they are suitable for exploring cultural and community opinions (USAID 2011, den Hartog et al. 2006, Krueger & Casey 2000). Group discussions can be used to gain community-level information, for example about cultural values, practices and social norms (Hennink 2007). Furthermore, the discussions are useful for discovering information about issues that influence behaviour, such as beliefs or attitudes. Most health-related decisions are made within a social context, and focus group studies allow the researcher to look into what kind of health behaviour is considered "normal" (Carter & Henderson 2005). In focus group discussions, participants are able to reflect on and react to each other's comments and give justification for the arguments raised (Hennink 2007). This can provide a deeper understanding of the issues and the context within which they are discussed.

Focus group discussions cannot, however, be used to gather reliable information about individual daily practices, because participants might be reluctant to describe what they actually do. Instead

they may simply repeat what other participants say, or say what they assume they are expected to (USAID 2011). On the other hand, data gathered from focus group discussions is often more moderate than data gathered from individual interviews, because participants provide quality checks during discussions, eliminating views they consider false or too extreme (Hennink 2007). Moreover, focus group discussions can be an effective method for acquiring a large volume of data in a relatively short time, as the number of issues raised and discussed in group discussions is often larger than in individual interviews.

According to literature, at least two discussions are needed for each study segment to obtain sufficient data (Hennink 2007, Krueger & Casey 2000). Therefore, we decided to organise two discussions in both of the villages. Group discussion participants are usually recruited so that they have similar characteristics or share a mutual experience on the research topic (Hennink 2007). In this study the target group were women with a 6 to 24-month-old child. We also organised two discussion groups for key informants who were healthcare and social workers in the region. They were familiar with the villages and local child feeding practices.

Focus group discussions are often led using a discussion guide, which usually includes several topic areas with 12–15 questions (Hennink 2007, Krueger & Casey 2000). The questions for the guides were developed based on relevant findings from previous qualitative research on child feeding. The guide for discussions with the mothers included questions about local infant and young child feeding practices, reasons for food choices, sources of health information and possible barriers and enablers for optimal complementary feeding (see annex III). Moreover, the purpose of the discussions with key informants was to acquire a broader view of child feeding practices and to clarify some of the issues mothers talked about (see discussion guide in annex V). We asked what the healthcare and social workers' thought about the current child feeding practices in the villages. We also inquired key informants' opinions about factors that constrain complementary feeding practices and their solutions for improving the nutritional status of young children. The discussion guides were translated in French but there was no need to translate the guide to a local language as many different languages were used during the discussion.

The first discussion group with mothers acted as a pilot group. After the first discussion its content and the questions were evaluated, but there was no need to make major changes. During the course of the research, some questions were, however, clarified and a few sub-questions were

added. This is common practice in exploratory research, where questions are often modified to work in a specific community (Hennink 2007).

5.1.2 Individual interviews

Qualitative interview is a method to achieve understanding of people's behaviour, life experience, attitudes and values (Silverman 2006). There are roughly three types of interviews: structured, semi-structured and unstructured. Structured interviews are done with a set of pre-determined questions. This method is usually used in quantitative research. Unstructured interviews are often used in fields such as cultural anthropology where the researcher might have a list of topics but tries not to actively control the flow of the discussion. The interview situation is conversational and might take a lot of time. Finally, semi-structured interviews are a mix of "open" and "closed" questions that are based on an interview guide (Hudelson 1994). The guide is a list of questions or topics that are discussed during the interview. The interviewer has the possibility to probe and ask additional questions, but the guide gives clear instructions on what topics should be covered.

The interviews in this study were made using a structured questionnaire with some open-ended question (a combination of semi-structured and structured interviewing techniques). This method was chosen in order to obtain descriptive data from the villages and to learn more about the mothers' child feeding practices and beliefs. The goal was to acquire more elaborate and personal information than from group discussions alone.

The structured questions concerning the participants' background information and general infant and young child feeding practices were based on the ProPAN, Process for the Promotion of Child Feeding Field Manual (PAHO 2013). ProPAN is a tool developed by the Pan American Health Organization and it is intended for use as a formative research guide. A few supplemental open questions were developed to gain more information about local feeding practices, cultural habits and knowledge and beliefs related to child feeding. The questionnaire included 101 questions. One-fourth were open-ended questions with a space to fill, and the rest were structured questions with pre-coded answers (annex VI). The questionnaire included questions about family, housing, caregiver's employment, breastfeeding, complementary feeding, child feeding styles, cooking and food procurement, sources of child feeding information, cultural habits and reasons for food choices. However, only a part of the questions were used for the final analysis. The questionnaire was pre-tested three times in a village located in the same region as

the study villages. After piloting, some minor changes were made in the wording and structure of the questions.

5.1.3 Triangulation

Triangulation is a useful method that provides multiple perspectives, and increases the validity and strength of the research, while decreasing bias (Thurmond 2001). Triangulation can be divided into four categories: data, methodological, investigator and theory triangulation. In this study I have used methodological and data triangulation.

Methodological triangulation is a way of combining or comparing data collected with different research methodologies (Thurmond 2001). It offers a great opportunity to reveal meaningful information that might have been left undiscovered if only a single data collection technique was used. Methodological triangulation has been used to compare the data collected from focus group discussions and from interviews. It is possible that the answers in these two situations are different. For example, in interviews participants may be able to speak more freely about sensitive issues than in group discussions. Data triangulation means using data collected in a different time, or environment or from different informants (Thurmond 2001). Data triangulation in this study has been done by comparing the answers of mothers to the answers obtained from the discussions with healthcare and social workers.

5.2 Field work

The field work for this study was conducted in the course of five weeks in April–May 2013. During the course of the field work the small rainy season was underway. The research team consisted of three researchers from Helsinki University (two master's students and one PhD researcher), a master's student from the University of Abomey Calavi, a local NGO representative and three freelance interpreters, of which two were university students majoring in English. Two senior researchers from Bioversity International and the University of Abomey Calavi were present during the preparation of the field work.

Before the data collection, one week in Cotonou was used for the preparation for the field work, during which the translators were taught basic concepts of qualitative research methods and of infant and young child nutrition. They were also trained to moderate group discussions and to translate interviews. The actual data collection took three weeks. We conducted 30 individual

interviews with mothers, four focus group discussions with mothers, two group discussion with healthcare workers and 20 observations that lasted two to five hours. The methodology and results of the observations are described in the master's thesis of Kirsi Ali-Kovero (unpublished). After the data collection, one week was spent on the last transcriptions, translations and data management.

Before entering the villages, we met with the village leaders and other authorities to endorse the study. Data collection in each village lasted for six days. The sampling was done with the help of the representative from a local NGO. Most of the 15 interviews were made during the first day. On the second day the remaining interviews were conducted, which was then followed by two focus group discussion. The focus group discussion for key informants was held on the fourth day of research. The observations were made during study days two to six. The transcriptions were made after the discussions and finalised after the field work period. All the data was collected from one village before moving to another village, where the aforementioned procedure was repeated. Before leaving the villages, village leaders were again met with.

5.3 Sampling and data collection

5.3.1 Individual interviews

Households for the individual interviews were randomly selected. The total sample in the interviews was 30 mother-child-pairs (table 3). Purposeful sampling was used to acquire information about children in three different age groups; 6–8 months, 9–11 months and 12–23 months. The goal was to have five children in each age group in both of the villages. Even though most children are given first foods before the age of six months, we could not include younger children in our study. There was a risk that questions about complementary foods might give mothers the wrong impression, as exclusive breastfeeding is recommended for six months.

Table 3: Number of participants in the study

	Individual interviews	**Focus group discussion**	**Key informant discussion**
Sohounmé	15	10 & 9	6
Akotomey	15	9 & 6	7
Total	**30**	**34**	**13**

In Sohounmè a glass bottle was spun in the centre of the village in the market square, and one road was chosen according to the direction in which the bottle was pointing. The direction was followed clockwise, so that at every crossroad we turned right. Every household was selected from the right side of the road. If there was more than one family living in a house, a random selection was made. When the route led back to the market square, a new direction was randomly chosen. Akotomey consisted of five hamlets or sub-villages and the distance between each one was several kilometres. In Akotomey, sampling was started in the main hamlet, and the direction was randomly chosen. If all the children suitable for the research had been reached, we moved on to the next hamlet. In the end, mothers and children were sampled from four hamlets.

Households were visited with the help of a local guide. The inhabitants were asked whether they had a child aged 6 to 23 months. Parents were asked for a birth certificate to verify the child's age. When the sub-sample for a certain age group became full, we moved to another house until a child in the right age group was found. The primary caregiver of the child was asked to be interviewed. In all of the cases, this was the mother of the child. If there were two children at the right age group in a household, the younger child was chosen for the study. After the data collection it was noted that one child was 23.6 months old. Thus, the total sample consists of 30 children from 6 to 24 months.

Each of the three researchers made ten interviews, with an assistance of a translator. The interviews were held in caregiver's homes or yards and they lasted for one to two hours. Before the interview, the participants were asked for a written consent, a copy of which was given to them (see annex I & II). Caregivers were also provided information about the study both orally in a local language and written in French. The translators asked the question in *Mina*, *Sahoue*, *Kotafon* or in *Fon*, depending on the language of the caregiver. The answers were translated to English, and answers were ticked or wrote down in the questionnaire. If further clarification was needed, especially during the open-ended questions, the researcher probed or asked the question in English, and had it translated for the caregiver.

5.3.2 Focus group discussions

A group size of 6 to 12 persons for focus group discussions is recommended in the literature (Hennink 2007). However, large groups can be difficult to moderate, especially if the moderator is not experienced (Carter & Henderson 2005). As the moderator of our study did not have much

experience in leading focus group discussions, the target size for our discussion groups was 6–10 women who had a child over six months but less than two years of age.

Whilst searching for caregivers for the interview, every house on the left side of the road was contacted for the focus group discussion. If there was a mother with a child who was 6 to 23 months old, she was asked to join the discussion. In addition, when sampling for the interviews, if a family had a child in the target age group but the sub-sample was full, the caregiver was asked to attend the group discussion. Similarly, if one household had two children at the right age group (in two different families for example), random selection was made and one participated in the interview and the other one in the group discussion. Two group discussions were organised on the same day both in Sohounmè and in Akotomey. Most of the sampling was done either during the same day of the discussions or on the previous days. Participants were given an approximate time of the discussion. About half an hour before the discussion, local guides went to remind the women about the discussion.

In Sohounmè a total of twenty people were asked to participate in two groups; two did not arrive and one woman was probably invited by her peers, which we realised only after the data collection. Thus, in the first group there were ten and in the second group nine women (table 3). The discussions were organised at the health centre, which was not functioning at the moment of research. The health centre was only a five minute walk from the village centre. The first discussion lasted for about 40 minutes and the second one for more than one hour. In Akotomey, as presented in table 3, nine women were invited to the first discussion and six women to the second one. For the first discussion all the contacted women showed up, but for the second one woman could not after all attend. The discussions were organised in two different hamlets; the first in a village meeting room and the second in the village school. Both discussions lasted for approximately one hour.

All of the discussions followed the same pattern. The translator who moderated the discussions was a teacher experienced in leading groups. The note-taker marked in a form each person who spoke and made additional notes and observations. I was also present, helping with the recording equipment. Before the discussions, each woman was individually explained the purpose of the study, and a background questionnaire was filled (annex IV). They were given an information note that explained the research in French and an oral consent was asked for. At the beginning of the discussion, the local NGO representative welcomed the participants and explained the study

in his own words. After this, the moderator added things that were listed in the guide, but were not previously mentioned. He explained the purpose of the recording equipment and asked for participants' approval for the recording. The moderator also asked the participants to respect the confidentiality of others and to not speak about the issues outside the group. The discussions were held in *Mina*, *Fon*, *Kotafon* or in *Sahoue*, depending on the person who was talking. Despite the many languages used, all of the participants were able to understand each other. If mothers seemed bored or tired, the moderator asked them to clap or sign traditional songs to activate each other. This was done at least once during each discussion. After the discussions, a refreshment and a small snack was offered to the women.

5.3.3 Key informant focus groups

Two focus groups discussions were organised for key informants who were healthcare and social workers working in the region. They were contacted through the representative from the local NGO. In total of 13 people attended these discussions (table 3). The discussions were held in French and they lasted approximately for an hour and a half. As in the group with mothers, key informants were offered a soft drink and a small snack. In addition, they were reimbursed for their traveling expenses, because many of them had to come from the other side of the commune to join the discussion.

The group for people working in Sohounmè was organised in the district's main house. Six people attended the group; two from social promotion centre, a medical officer and a medical assistant from the district's main health centre, a nurse from the health centre of the commune and one medical assistant from a health centre in a village close to Sohounmè. Due to lack of time, two of the questions had to be skipped.

The discussion group for key informants of Akotomey was organised in the commune's health centre. Seven people joined the discussion; a medical assistant and a medical officer from the main health centre of the commune, a director of the social promotion centre, two medical assistants from health centre closer to the village, a medical assistant from private Christian clinic and the director of the health centre of Agbodji village, located close to Akotomey. Because this was the last discussion, some additional questions were added to clarify things that had been seen and heard in the field.

5.4 Data preparation

Translations of the group discussions were made by the two translators (moderator and note-taker). They listened to the recordings and simultaneously translated their content, and I wrote the transcriptions directly in English. The mothers were given codes so that their identity could be kept secret. When the first version of the transcription was finished, the translator listened to the tape again and made necessary clarifications and corrections. During the transcription process, I constantly asked questions about the text and tried to clarify unclear quotations, wordings or proverbs.

During the discussions with mothers, there was a lot of background noise due to the fact that almost all had their babies with them. In addition, non-participants often distracted the discussions. In Sohounmè the venue was outdoors and close to the main road to the village. In Akotomey, the first discussion was held almost at the centre of the village and thus gathered a lot of attention. Because of these distractions and interruptions verbatim transcriptions were impossible to make. If local words were used to describe foods or phenomena, they were added in the transcription. Because participants were often repeating what others had said and talking at the same time, all the quotations could not be connected to a person. Thus, in the transcriptions participants are marked only occasionally. In case somebody made a longer comment, this could be marked in the transcriptions. The discussions with the key informants were calmer and thus verbatim transcriptions could be made.

Quantitative and qualitative interview data was entered first into a password protected Excel file. This was done by the PhD student who also did one-third of the interviews. Mothers were given codes in order to protect their privacy. During data processing, unclear, hand-written notes were discussed and clarified. Problems related to translations such as the use of local names for foods were discussed and clarified with the interpreters.

5.5 Analysis

The data consists of transcriptions of focus group discussions and answers from structured and open-ended interview questions. Also notes taken during the field work are used in the analysis.

Only a part of the interview data was used for this study. Some of the interview data was quantitatively analysed by counting descriptive statistical figures with Microsoft Excel 2010. Excel was also used for qualitative content analysis, for example to study what were the first foods children received, the most common foods children ate and the perceptions of good and bad foods.

The textual data used in the qualitative analysis consisted of focus group discussion transcriptions (nearly 90 pages) and open-ended questions from the questionnaire. In the analysis, the basic principles of content and thematic analysis were applied (see Silverman 2006). The analysis was inductive and data-driven. In content and thematic analysis coding ensures that the data is analysed systematically and that all the relevant data is included in the final results (Hudelson 1994). If the data is not systematically analysed, the researchers' own first impressions may distort the results. Codes are usually derived from the research questions or from key concepts and themes that have emerged during research. Coding is especially useful when the textual data is large in quantity.

The text was coded using the Atlas.ti program (version 7.0). Segments of texts or quotations were coded using in-vivo codes that emerged from the data. The auto-coding function of Atlas.ti was used for example for foods mentioned in the data and for other non-abstract issues. The first coding process was mainly driven by the first research question of current feeding practices in the villages. After the first coding process, the codes were checked. If codes were unclear, they were clarified. If codes had only a few quotations, they were combined to form broader codes or concepts, and some irrelevant codes were deleted. The second coding was made by trying to identify reasons and determinants behind feeding practices (research questions two and three). Codes were labelled, for example "fathers are away", "money" or "food taboos". After this coding, the codes were again checked using the complete list of codes. Yet again, some new codes were added and some combinations were made. At the end, the list included over 130 codes, of which 60 explained "reasons" for feeding practices. Codes were then grouped into "supercodes" that represent the sub-themes in this analysis. These sub-themes were finally grouped into four larger themes.

6. RESULTS

The result section is divided into three parts. The first section describes the characteristics of mothers and households and the second part the feeding practises of infants and young children in the villages. In the third section I will discuss the determinants of the practices.

6.1 Characteristics of mothers and households

Table 4 represents the characteristics of mothers who attended the interviews and the group discussion.

Table 4: Characteristics of mothers attending the study

Characteristic	**Summary statistics**	
	Interviews, n=30	Group discussions n=34
Maternal age, y [a]	27 ± 6,5 (16 39)	26 ± 6,0 (17 41)
Child age, mo [a]	12 ± 4,8 (6 24)	14 ± 4,8 (7 23)
Married, % (n)	97 (29)	*
Father living in the household, % (n)	80 (24)	*
Size of household, n [a]	6,7 ± 2,6 (3 12)	5,5 ± 1,9 (2 10)
Parity, n [a]	*	2,8 ± 1,5 (1 5)
Under-5-children in the household, n [a]	1,7 ± 0,6 (1 3)	*
Education, y [a]	4,2 ± 3,6 (0 10)	3,1 ± 3,0 (0 9)
No education, % (n)	37 (11)	44 (15)
Literacy, % (n)	50 (15)	*
Employment, % (n)	73 (22)	79 (27)
Religion, Christian, % (n)	73 (22)	79 (27)
Religion, traditional, % (n)	20 (6)	21 (7)

[a] Mean and standard deviation: range in parentheses

* Question was not asked

The average age of mothers was 27 years in the individual interviews and 26 years in the focus group discussions. Participants in the three first focus groups were more or less the same age, 24 years on average, and with 2.5 children. However, the second group in Akotomey had a different age structure: the participants were 33 years old on average and had four children.

Based on the interviews, approximately half of the mothers were illiterate (table 4). Over half of the mothers had received some education, the average number of years of schooling being four among the interviewed and three in the focus group discussion. Most of the women considered

themselves Christians, and around one-fifth reported they practiced Voodoo or other traditional religions.

Most of the mothers were married, however five of them lived alone, because the father was working elsewhere, often in the economic capital Cotonou or in Nigeria (table 4). Size of the household was little over six persons among all the participants. In the group discussion mothers had 2.8 children on average, but the question of the number of children was not asked in the individual interviews.

The majority of women were engaged in some income-generating activity or were employed. Most of them sold food, for example maize porridge, bread, cassava flour, snacks, nuts, fish, palm oil, beans, fruits or condiments. Some sold clothes, shoes, soap or mobile credit. A few reported being employed at a farm. There were also some women who said they worked as hairdressers or dressmakers. In Sohounmè many women were occasionally employed in a stone mine nearby as stone carriers or washers.

Most of the households had at least some food production, according to information received in the interviews (table 5). Only three mothers reported they did not cultivate any crops and only five that they did not own any animals. Although ownership of livestock was common, animals were more often raised for selling than for own consumption. Some said that their husbands fished and a few reported of hunting. Some mothers described that they receive food from their relatives, for example from grandmothers who were farming.

Table 5 : Agricultural activities and livestock, interview data n = 30

Activity	**Number of participants (n = 30)**	**% of all participants**
Farming	27	90
Grains, roots or tubers	27	90
Legumes, nuts	15	50
Green leafy vegetables	8	27
Other fruits or vegetables	9	30
Livestock	25	83
Chickens or ducks for eggs	9	30
Chickens or ducks for meat	14	47
Chickens or ducks for selling	21	70
Goats or pigs for meat	10	33
Goats or pigs for selling	22	73

According to the interviews, most people had access to clean water (table 6). Two-thirds had no sanitation facilities. In Sohounmè nobody of the 15 interviewed had electricity in their homes. About one-third had a television or radio and two-thirds owned a mobile phone. In Akotomey two houses had electricity and the ownership of mobile phones and radio was more common than in Sohounmè. Mobile credit was easily purchased in both of the villages.

Table 6: Housing in the villages, interview data n = 30

	Number of households			
	Sohounmè	**Akotomey**	**Total**	**% of all households**
Water source				
Public tap	14	13	27	90
Well or rainwater	1	2	3	10
Sanitation				
Bush	10	10	20	67
Pit latrine	5	5	10	33
Property				
Electricity	0	2	2	7
Radio	5	6	11	37
Television	4	4	8	27
Phone	10	13	23	77
Fridge	0	0	0	0

6.2 Feeding of young children in the villages

I will now discuss the feeding of infants and young children in the villages. Firstly, I describe transition from exclusive breastfeeding to complementary foods. This will be followed by a description of common complementary foods children receive.

6.2.1 Transition from exclusive breastfeeding to family foods

All the children in the sample, with the exception of one, were breastfed after birth. Nearly half of the children got some liquids less than three days after the birth, as illustrated in table 7. The liquids given to infants were usually water or traditional medicine, which is an herbal infusion made of leaves and roots. Several mothers in the group discussion mentioned that they had given traditional medicine to their babies almost right after birth, even though nurses at the hospital had recommended otherwise. According to the mothers the medicine is given to infants daily and it is believed to increase the appetite and prevent various diseases.

> The most important food for a little child in the morning is *amma* [traditional medicine].
>
> *Group discussion: mother, 32 years old, four children*

According to mothers, the median age for beginning liquids is three months, answers ranging from zero to eight months (table 7). In addition to water and traditional medicine, some mothers had given their children fruit juices. Four children had received infant formula as new-borns. The formula was bought from the pharmacy or from the hospital. In conclusion, the duration of exclusive breastfeeding in the villages is shorter than recommended six months.

Table 7: Feeding of young children, interview data n = 30

	Summary statistics
Child age, mo [a]	12 ± 4,8 (6 24)
Girls, % (n)	57 (17)
Breastfed[b], % (n)	93 (28)
Fed complementary foods or liquids[b], % (n)	93 (28)
Duration of breastfeeding older children[c], mo[d]	24 ± 7,2 (12 36)
Liquids given after birth, % (n)	47 (14)
Age of starting liquids, mo[d]	3 ± 2,9 (0 8)
Age of starting complementary foods, mo[d]	6 ± 2,7 (1 12)
Use of infant formula, % (n)	13 (4)
Own foods for the child, % (n)	40 (12)

[a] Mean and standard deviation: range in parentheses

[b] Based on question "was your child breastfed or given other liquids or foods yesterday"

[c] Data available of 24 women

[d] Median and standard deviation: range in parentheses

Caregivers reported giving first foods to their children when they were six months old, as presented in table 7. Nearly half of the mothers in the interviews reported giving first foods before the recommended six months. The first food to be given was usually gruel, liquid maize porridge. In the group discussions, some of the mothers told us that gruel is given to children from six months onwards, whereas some reported giving gruel already from the first or the second month on and some from the fourth month on. According to the healthcare workers, mothers start giving gruel before the recommended six months.

Other popular first solid complementary food was stiff maize porridge (Fr. *pâte*), which was given with sauce made of green leafy vegetables, for example bush okra (*Cochorus olitorius*). However, in

the group discussions some mothers disagreed with this argument, saying that *pâte* should be given only when children are six months old or even one year old. In addition, a few mothers reported that they had given children macaroni, beans, rice or eggs as the first solid foods.

All the children in the interview sample had started eating complementary foods. Furthermore, almost all the children had been given other foods or liquids beside breast milk on the previous day of the research (table 7). Of the two children who had not eaten, one was sick at the time and the other had not eaten on the previous day, but had gotten foods on other days of the previous week. Children were generally fed three to four times a day, according to the mothers who took part in group discussions. The frequency of feeding was not thoroughly discussed in the individual interviews.

Despite the low adherence to the recommendation of exclusive breastfeeding, all the children were breastfed relatively long. Mothers reported breastfeeding their elder children for two years, on average (table 7). In this sample all except two children were breastfed on the day before the interview. One of the non-breastfed children was already 22 months old at the time, while the other had never been breastfed. Nearly every mother emphasized that their children were breastfed on demand, whenever the baby wanted. Mothers could not tell how many times they breastfed their children each day. Even during the one hour interview some mothers breastfed their baby several times.

6.2.2 Common complementary foods for young children

In order to investigate the common complementary foods young children receive in the villages, mothers were asked what foods they had given to their children on the day before the interview and during the previous week. Adding this data to the answers from the focus group discussions, a list of the foods commonly given to children from 6 to 24 months is presented in table 8.

Maize gruel and porridge

Among the foods given to children, the most common complementary food appears to be maize gruel, which is very thin, liquid porridge. Maize gruel was thought to be something suitable for small children before they move on eating the "proper food". Moreover, maize is widely available, cultivated in the region and available also in the poorest families.

Table 8: Complementary foods given to children aged 6 to 24 months

Foods mentioned	Preparation	Remarks about consumption and availability
Grains, roots and tubers		
Maize gruel	Liquid gruel, sometimes enriched with soya, sorghum, small dried fish, peanuts, milk, salt or sugar	The first food for children after breast milk. Eaten daily, mostly given to children less than 1 year old.
Maize pâte	Thick maize porridge	The second food for children after gruel. Consumed daily and usually with sauce.
Akassa	Fermented thick maize porridge	Sold in the villages.
Cassava	Cooked or fried	Because of hard structure it is not often considered suitable for small children. Usually given to children over year old.
Gari (cassava flour)	Roasted cassava, which is grounded and turned into flour. Served with water and also with beans or eggs. Seasoned with red palm oil.	Sold in the markets.
Macaroni	Mixed with spices and sometimes eggs	Considered good food for children, but consumption is irregular. There are instant-macaroni mixtures available.
Rice	Cooked	Common consumption.
Yams	Cooked or fried	Consumption is rare.
Legumes and nuts		
Red or white beans	Boiled. Served as such or mixed with gari and palm oil	Cultivated in the area. Common consumption.
Soya beans	As a bean powder that is turned into porridge. Also processed to local cheese	Porridges are sometimes enriched with soya bean powder. Soya cheese is not given to small children.
Peanuts	Roasted. Eaten as a snack or mixed with sauces and porridge	Considered something that makes foods taste good.
Dairy products		
Milk	Condensed, cow milk and milk powder	Consumption is very rare. Some products are available in the markets.
Flesh foods		
Goat and chicken meat, pork		Consumption is extremely very rare. Only on special occasions.
Game (rabbit, bush rat)		Only a few reported hunting and eating. Among those, consumption was regular.

Dowèvi, small local fish	Dried fish mixed with foods	Frequent consumption, several times a week. Sold in the villages. Dowevi is not considered fish, more like a condiment.
Other local fish (*akpavi*, *akpa*)	Fresh fish	For some consumption was regular (weekly or more often). Some reported problem of scarcity.
Eggs		
Chicken eggs	Consumed often mixed with macaroni, yams or gari	Consumption is very rare although is considered suitable food for children.
Vitamin-A rich fruits and vegetables		
Red palm nut oil and pulp juice	Base of many sauces. Served also with beans and other foods.	Cultivated and processed in the villages.
Mango	Bush mango. Eaten as such or pressed into juice	Consumption depends on season. Eaten when available
Other vegetables		
Bush okra (*Cochorus olitorius*)	Green leafy vegetable, served in a sauce with fish and spices. Eaten with *pâte*.	Regular consumption, several times a week.
African eggplant (*Solanum macrocarpon*)	Green leafy vegetable, served in a sauce with *pâte*	Common consumption but not as common as craincrain.
Other local green leafy vegetables	Bean and cassava leaves, *ayouma*, *wontou*, *sôman*, *fotéte*, *loman*. Cooked and in a sauce	Occasionally when available.
Chili pepper	In a sauce	Base of many sauces but not usually considered an appropriate food for small children.
Potatoes	Fried or boiled	Consumption is rare.
Other local vegetables	Okra (Fr. *gombo*), onions, tomatoes	Consumption is rare.
Other fruits		
Orange	Served as a juice or a fruit	Consumption depends on season. Eaten when available.
Other local fruits	Pineapple, guava, papaya, African apple, coconut	Consumption is rare.
Banana	Different types. Eaten as such or fried in oil (aloko)	Consumption is rare.
Other foods		
Doko, *agpeli*, *kponnovi* and other local fried snacks	Pastries fried in oil.	Sold in the villages. Consumed occasionally.
Biscuits	As such or mixed with porridge	Eaten sometimes.

Based on classification of WHO Indicators for assessing infant and young child feeding practices, 2008

> The baby is not ready to eat solid food, but breast milk is not sufficient. As gruel is the middle between breast milk and solid food, we find it good for our children.
> *Group discussion: mother 31 years old, five children*

> As the baby is not ready for *pâte* [thick maize porridge], we have to start with gruel
> *Group discussion: mother, 20 years old, one child*

The gruel was sometimes enriched with dried fish powder, biscuits, soya bean powder or groundnuts. Also sugar may be added. In the group discussions, mothers expressed that enriched porridges are good for children and they described how these should be prepared. However, whether this belief reflected actual practices, remained unclear to us. In the individual interviews enriched gruels did not come up as often, but this might occurred through flawed interviewing technique. During the first few interviews, it did not always occur to us to ask, whether there was something else mixed with maize gruel.

> You take maize, you ground the maize, you turn it to powder, and you add *dowèví* [local small fish], peanuts and biscuits. Then you mix it together and you make sure that it is interesting for the child.
> *Group discussion: mother, 20 years old, one child*

While gruel was often the first complementary food given to a child, the next one was usually *pâte*, thick maize porridge, which is more like dough than porridge. It is served with different sauces, the most common one being liquid, somewhat slimy green sauce made of bush okra (*Cochorus olitorius*). Sometimes also spices and dried fish are added.

Other staple foods and fruits and vegetables

In addition to maize gruel and porridge, people ate fermented maize porridge sold in the markets (table 8). Other commonly cultivated crop in the region is cassava, which was eaten boiled or fried. Alternatively it is processed to flour (Fr. *gari*) and mixed with many different foods. Children were also given macaroni, which turned out to be a food that mothers believe to be extremely suitable for small children (see section 6.3.1). Consumption of rice, which is also cultivated in the region, was less common among children. Furthermore, based on our data, yam was not given to children very often.

Fruit and vegetable consumption appear to be highly dependent on seasons. When in season, fruits such as mangos and oranges are consumed often. Consumption of vitamin A-rich red palm nut oil and juice was regular, since they were bases of many sauces. Also green leafy vegetables were commonly served. However, other vegetables, such as tomatoes, onions, chili pepper and okra, were rarely consumed (table 8).

Protein sources

Protein sources constituted mainly of vegetable proteins and fish as demonstrated in table 8. Beans and nuts were the most common sources of vegetable proteins. Soya beans were consumed as flour that can be cooked into gruel or porridge, and sometimes soya flour was mixed with maize flour. Soya cheese was also occasionally eaten. Fish was mainly eaten as small, dried, grounded fish (in local language *dowèví*) that was added to sauces and foods. A few times mothers described having given their children *pâte* with sauce that includes *dowèví*, but in the next sentence they contradicted this by telling us that they never give fish to them. Thus it seems that small amounts of processed *dowèví*, is not regarded as fish but more like a condiment. Consumption of bigger fish seemed to be fairly irregular, even though both villages were surrounded by a lake. Some respondents pointed out that fish is scarce.

Other animal source foods were rarely eaten. Some mothers told us that their husband hunted and among those families, meat appeared to be eaten more often. Other than that, consumption of meat was extremely rare. Moreover, milk products were rarely given to children. Consumption of eggs seemed irregular as well.

Liquids and snacks

The use of liquids was not thoroughly discussed in the interviews or group discussion. Small children drank breast milk on demand and also water. Some mothers gave traditional medicine systematically every morning. Juices were sometimes mentioned, but their consumption is likely to be rare. Tea was often mentioned in the group discussions about foods that mothers would like to give their children. However, it did not come up in the individual interviews.

Consumption of snacks appears to be common. In the interviews 22 mothers out of 30 told us that they had given snacks to their children. There were many local snacks available in the villages. Village women made fat fried pastries, such as *doko*s and *agbeli*s and others that were sold

on relatively low prices (25 Francs, equals 4 euro cents). Also commercially produced biscuits were sold in the villages, and some of them were vitamin-fortified. In addition, fruits were given to children as a snack, especially mangos, which were on season at the time of the research. Moreover, mothers sometimes gave children small portions of macaroni, beans and maize gruel between meal times. Interestingly, breastfeeding was also mentioned as a "snack". However, the healthcare workers contradicted the practice of giving snacks saying that mothers do not have enough resources to give children something to eat in between meals. This issue is further discussed in section 6.3.4.

Consumption of foods in different age periods

Mother-child-pairs were selected into the interviews so that there were children in three different age groups (6–8; 9–11 and 12–24 months). However, there were no great differences to be observed in consumption of foods between the age groups. This might be because children begin to consume family foods at very early age. Thus, children over six months have already very similar diets but in different quantities.

Two food stuffs that marked a difference in consumption between age groups were maize gruel and cassava. It seems that the smaller children, under the age of one, consumed gruel more often than those who were over one year old. Nine out of ten children in the lowest age group had eaten gruel during the previous week, compared with four children in the highest age group. These older children had also eaten more thick maize porridge *pâte*, but this difference was not as obvious as with gruel.

Moreover, it appears that children under the age of one ate less cassava than older children. Cassava was eaten as such or as flour mixed with foods (Fr. *gari*). This finding was confirmed in the group discussion where some mothers reasoned that cassava was not suitable for small children because of its hard structure. *Gari* was also one of the few foods that was believed to be unsuitable for children as it was said to cause stomach pains, worm infection and other diseases (see section 6.3.1).

In conclusion, the diet of children aged 6 to 24 months lacked variety, based on my analysis. The most common complementary food was liquid maize gruel that was given to infants on average at six months of age, but sometimes earlier than this. Gruel was sometimes enriched for example

with fish powder or soya flour. The first solid complementary food was usually thick maize porridge, *pâte*. Porridge was served with different sauces, usually made from green leafy vegetables. Consumption of fruits and vegetables varied according to the season. The consumption of green leafy vegetables appears to be regular, but other vegetables were eaten less often. Protein sources seem to be limited, the most common being legumes and small dried fish. Children were breastfed often and for an extended period of time, however the duration of exclusive breastfeeding was short, because herbal infusions and water were often given to new-borns.

6.3 Factors influencing complementary feeding in the villages

The factors influencing complementary feeding and food choices were grouped under four themes. The first theme covers mothers' knowledge framework, meaning perception, knowledge of and beliefs about child feeding. The second theme covers the attributes of the child, which influence practices. The third theme describes contextual determinants on the household-level, such as social support and decision-making of feeding choices. Fourth theme includes the influence of community context, the agriculture, healthcare services and local economy.

6.3.1 Mothers' knowledge framework of complementary feeding

Maternal knowledge framework includes mothers' accounts, perceptions and ideas of childcare and feeding. It contains cultural beliefs and indigenous knowledge, but also nutritional, and medical facts of foods and feeding.

Why some foods are better than others

Mothers had several ways of rationalizing why certain foods were better than other. Their accounts can be roughly categorized as follows: foods give vitamins; foods give energy; foods are good or bad for health and growth; the structure of foods is suitable for children; foods taste good.

One of the most popular reasons to think food was good was that it "gives vitamins" or contains vitamins. In mothers' knowledge vitamins seemed to be the thing in food that is good. It is probable that mothers have learned the concept of vitamins from healthcare professionals or from school. When asked, mothers could not really explain what vitamins were; they stated that

vitamins "are good for preventing diseases" and that "vitamins will make children healthy and strong". Vitamins purchased from the pharmacy were a solution to children's bad appetite. Moreover, if a child falls ill, it might be because s/he has not received sufficiently vitamins.

> *Moderator:* Now, are there some foods that are very good for children under two years?
> *Mother:* Are you talking about those foods that are very good and give vitamins to children? Porridge for instance gives vitamins to children.
> *Moderator:* What kind of porridge?
> *Mother:* Porridge made of maize powder. Anything made of maize gives vitamins very well.
> *Group discussion: mother, 37 years old, five children*

> They say these foods [mentions soya porridge, rice, macaroni and peanut sauce] include vitamins. Our mothers have taught us this. Vitamins help children grow well and have a strong body.
> *Interview: mother, 35 years old, no education*

Foods were considered good if they gave energy, for example in case one was tired. Furthermore, a good quality of food was that it made children full and satisfied. Food was good for children, if it stopped children from crying and helped them to sleep better.

> Getting satisfied is the most important thing, if child can eat and be full, that's all.
> *Group discussion: mother, 36 years old, five children*

Another general expression in describing foods was that foods "give blood" or ensure "good blood quality" meaning that these foods made children healthy. Moreover, children's growth was often referred to and some foods were believed to promote growth. Different reasons were also given about foods effect on stomach, digestion and illnesses of intestines or stomach. For example, rice was believed to cause worm infection and orange to help digestion.

The structure of food was one rationale behind choices. Macaroni and gruel were good foods, because their soft structure was perceived good for small children. Children's development level was referred to when mothers explained why some foods where unsuitable for young children.

For example cassava was described as being too hard and impossible for children to eat, because they do not have teeth to chew.

> Yes, from one and half years, if the child has teeth, he can eat fish.
> *Group discussion: mother, 31 years old, four children*

The taste of food was not considered very important. However, some mothers explained how, for example, mixing peanuts to a sauce makes it taste good.

> […] but if you want to cook the sauce, you ground the peanuts that you add in order to make it delicious so that the child finds it interesting and eats well.
> *Group discussion: mother, 19 years old, two children*

Mothers were asked about the perceived "good" and "bad" foods for children under the age of two both in the interviews and in the group discussion. The idea behind these questions was to get an idea of complementary foods the mothers thought were most suitable for children. We also wanted to investigate whether food taboos existed in the villages. The results from the interviews and group discussions combined are presented in tables 9 and 10.

Accounts of unsuitable or "bad" complementary foods

Based on my analysis, there are no strong dietary taboos in the villages. Mothers in this study emphasized how children can eat everything and that there are no specific bad foods for children. "Whatever I can eat, my child can eat", mothers said. This idea is linked to the common custom of shared meals, starting already when babies are very young. In the interviews only half of the mothers had some kind of an answer to the question: "Are there some foods that are bad for children?"

Mothers seemed to evaluate the foods based on its consequences. For example if *gari* (cassava flour) caused stomach pains for children, it was considered to be unsuitable.

> Why *gari* is not good, is because sometimes when you give it to the child, it will give stomach ache to the child. That is why it is no good.
> *Group discussion: mother, 23 years old, three children*

Another rationale for unsuitable foods was that the children were not old enough or ready to eat those foods, such as spicy foods or hard cassava or rice. Mothers often explained how one should cook separate foods for children as they cannot eat chili or strong spices. This is probably an advice mothers have received from healthcare professionals. In section 6.3.3 I will discuss more the actual practice of preparing separate meals for children and the custom of family meals.

Table 9: Mothers' accounts of bad and unsuitable complementary foods

Food	Rationale	Remarks
Rice	Not good for stomach or the digestion Causes worm infection Causes illnesses No vitamins in rice Children is not old enough, their organism is not strong	Rice should be soft and child should be old enough before getting rice.
Gari (cassava flour)	Causes illnesses (malaria, diarrhoea, stomach ache) Causes indigestions Not good for growth	Also perceived as a good and suitable food for children.
Beans	Beans are not easy to digest Should be served only in small portions	Mostly perceived as a good food, but in moderation.
Spicy foods (chili pepper)	Children cannot eat spicy food	Can be given little by little since 8 months.
Sweets	Causes stomach pain and worm infection Not good for teeth	Children like them.
Cassava	The structure is hard and children cannot eat it as they do not have teeth Causes indigestions	Controversial, some say that well-cooked cassava is good for children.

The hypothesis of taboos about meat, fish or eggs did not come up in the discussions. A few of the healthcare workers from Sohounmè gave examples of food taboos. They explained that some families have "totems", foods they are not allowed to eat, such as chicken, eggs or certain crops. Only one mother mentioned in the discussion that "they don't want me to teach him to eat fish" but it seems that this was just an individual case and does not represent the beliefs in the whole community. Furthermore, many of the healthcare and social workers underlined that even though taboos may have been common before, beliefs in the rural communities are these days changing:

> […] If we do a case study of the area, we will notice some taboos, but we have already passed over that step. Because the world is changing. And at such a step, we can no longer talk about food taboos. […] Even if they ask you not to eat… You get inside your room alone and you eat... If you don't tell anybody that you have eaten, nothing will happen to you. [Laughing]
> *Key informant group discussion: Manager, social promotion centre*

In conclusion, the answers in the table 9 represent mainly foods that mothers think might cause health problems or to be otherwise unsuitable for young children. Mothers decide whether food is suitable or not based on each individual child.

> We can give a child everything. But if you give him something and he refuses or that gives him stomach pain, you can stop giving him that.
> *Group discussion: mother, identity unknown*

Accounts of "good" and suitable complementary foods

Question about "good" foods was easier for mothers to answer than the question about "bad" foods. They could easily list foods, which they thought were suitable and good for children.

By far the most popular answer was macaroni, which was mentioned by the vast majority both in the individual interviews and in the group discussions. "Macaroni" in this study refers to a range of wheat products such as spaghetti and noodles. Macaroni was considered healthy and to contain vitamins and energy. Soft macaroni was considered to be food children like and which is easy for them to eat.

> If macaroni is good for his stomach, you should get used to buying and cooking it for him.
> *Group discussion: mother, 32 years old, six children*

Healthcare professionals could not explain the popularity of macaroni. They said that they do not automatically recommend it to mothers, but occasionally for those who have enough money to buy it. Healthcare workers too explained that macaroni is food children themselves prefer.

There were ready-made, instant-macaroni mixtures available in the markets. Mothers mentioned for example *Indomie* noodle-mixture, which is a global brand of Dufil's that is manufactured in several countries, including Nigeria. *Indomie* was launched in Benin not earlier than in 2012 and is likely to have been actively advertised ever since. In Nigeria Indomie is 600 million dollar business and the noodle-mixture is heavily marketed at mothers of young children (The Herald Nigeria, July 2013). One of the popular catch phrases is "No mama be like you, no noodles be like Indomie". One reason behind macaroni's popularity might be that this kind of Western-style, packed and easy-to-make products are especially attractive to rural women. They are something mothers would buy, if they had money.

Macaroni with eggs was considered an especially good and healthy food for children. Mothers described that eggs were rich in vitamins and had the appropriate consistency for young children. This is probably a message mothers have received from healthcare professionals. Some mothers mentioned that eggs had been recommended to them when they were given advice about child feeding. The healthcare workers also emphasized that macaroni should be mixed with egg or egg yolk to increase its nutritional value. However, most of the mothers reported that eggs were too expensive for them to buy.

> What I think is, if the child is eight months and you want to cook gruel for him, you can add the yellow part of the egg so that it gives energy and it is very good.
> *Group discussion: mother, 25 years old, one child*

Maize, liquid maize gruel and thicker maize porridge (*pâte*) were also regarded as suitable foods for children. Mothers reported that these foods fill up children's stomachs and they are easy to eat, because of their soft or liquid structure. Also rice was considered healthy, but somewhat controversial, since it was also believed to cause worm infections and diseases.

> Rice alone is not good. It isn't good for the stomach.
> *Interview: mother, 24 years old*

Beans were considered to be both suitable and unsuitable for children. The idea seemed to be, that beans are good but that they can cause indigestion and should therefore be served in only small portions.

Table 10: Mothers' accounts of good and suitable complementary foods

Food	Rationale	Remarks
Macaroni	Gives vitamins Children like it Good for health and "blood" Gives energy and makes children full Good for growth The structure of the food is good for children	Most popular answer. Perceived as a food extremely suitable for young children.
Beans	Gives vitamins Good for health and "blood" Good for growth Children like it	May also cause indigestion.
Rice	Gives vitamins Child likes it Gives blood, is healthy	Controversial. Rice may also cause disease and stomach problems.
Pâte (maize porridge)	Gives energy Makes children full and satisfied Gives vitamins	Children should be old enough. If children are too young, *pâte* can be bad for growth.
Eggs	Gives vitamins Child likes it Gives blood, is healthy Gives energy	Often mentioned in mixtures with macaroni and other foods. Especially yolk is considered beneficial.
Fruits	Gives energy (if tired) Contains lot of vitamins Gives blood, is healthy Facilitates digestion, is good for digestion (oranges)	Includes banana, orange, pineapple and mango.
Vegetables	For bush okra: child can eat it easily and it gives energy For yams: is healthy and children like it	Includes bush okra and yams.
Gruel	Makes children full and satisfied Good for small children because of structure. Easy to eat. Gives vitamins Makes children strong and is good for growth	Mainly maize, but also soya and sorghum gruel and mixtures.
Fish	Is healthy and good for blood Gives energy	Child should have teeth in order to eat fish.
Sweet or greasy snacks	Soft structure is good for children Children like them	Includes *doko* and other local snacks, biscuits and sweets.

Fruits or vegetables as a food group were not mentioned among beneficial foods but as individual foods many were thought healthy. Especially oranges were considered to be healthy, and they were considered to give energy and vitamins and to help with digestion. Also banana, pineapple and mango were mentioned. Among vegetables only bush okra (*Cochorus olitorius*), yams, potato and salad were believed to be good foods for young children.

> […] orange and banana gives blood. Oranges give you energy if you are tired.
> *Interview: mother 36 years old*

Animal source foods were hardly mentioned. Fish often came up in the discussions about foods mothers would like to buy for their children, if they had money. Fish was often referred to as "big fish" while the common small fish, *dowèví* did not come up in the group discussions. Meat was occasionally mentioned in group discussion, but not in the individual interviews. Milk mixed with gruel was also thought to be good for children. It might be that fish, meat and milk are consumed too rarely for them to occur to the mothers when listing good foods. Therefore, the lack of mentioning does not necessarily imply that they are considered to have a negative or even neutral effect.

Lastly, local snacks such as *doko*s and *agbeli*s were often mentioned when mothers listed good foods. They were not considered especially healthy, rather they were regarded as easy to eat and something that would please children. This was the argument for also biscuits and sweets. Furthermore, biscuits might have similar appeal to mothers as macaroni; they are commercially made, packed and sold in the markets. Some mothers mentioned ABC-biscuits, which is a name of a brand.

Foods a "good mother" would give

In the focus group discussions we asked "In your opinion, how do 'good mothers' feed their children in this community?" The reaction to this question was often similar to this mother:

> How can you really feed your children as a 'good mother', if you don't have money?
> *Group discussion: mother, 20 years old, one child*

Many of the foods mothers listed were foods that mothers could not normally afford, such as milk, meat, tea and sweets, as described in the next quotation:

> So you are talking about a mother who has money and who is in her own household with her husband! She should cook rice with meat, macaroni or salad and bread. She should make tea for her children. She could also give fruits such as pineapple…
> *Group discussion: mother 31 years old, five children*

Nonetheless, most of the foods in the "menu of a good mother" were common everyday foods, such as *pâte* (thick maize porridge), rice and macaroni. Many of the mothers said that if they had money, they would buy foods that their children like:

> There are some people who give birth to a child. [When] they see something that they think is good, they can give it to the child, and if you have money you will buy to the child anything that pleases him.
> *Group discussion: mother, 36 years old, five children*

To sum up, mothers appreciated various complementary foods. A positive finding was that locally available, nutritious foods such as eggs, beans, fish and some fruits and vegetables were considered suitable and beneficial for young children. A slightly alarming result is the reverence for macaroni. Macaroni needs to be purchased and it may not be the best or the most nutritious food for which to spend one's money. In order to be sufficiently nutritious, it should be prepared mixed with eggs or other more nutritious foods; if it is eaten as such, macaroni contains hardly any essential nutrients.

Mothers' knowledge of child feeding recommendations and stunting

In this section I will evaluate the mothers' knowledge of WHO's child feeding recommendations and how their knowledge relates to actual practice. As shown in the previous chapters, mothers had different ways to rationalize why certain foods were better than others. Their knowledge is most likely a diffusion of their own comprehension of the issue and the information they have received from their elders and pears or from teachers, healthcare and social workers.

According to our data, no information campaigns had been organised in the villages, at least not recently. In the interviews, we asked if the mother had received information about child feeding during the past three months. Only eight mothers out of 30 answered yes, of which seven had received information from a family member and only one from a healthcare facility. In the group discussions and during other open-ended questions in the individual interviews, some mothers mentioned having received child feeding information from the nurses in the hospital, usually after having given birth. A few mothers in Sohounmè told us that they had attended group meetings where they had been taught about child care. According to the healthcare workers, a Danish NGO had, in fact, organised meetings and cooking demonstrations in the village. However, these activities had ended several years ago. Moreover, some mothers mentioned having learned about good foods and vitamins at school. Over half of the women in our study had at least some education, usually a few years at the primary school (table 4).

In general, mothers were quite familiar with the recommendation of exclusive breastfeeding. However, several of them told us that the recommendation was not usually followed, in the sense that mothers gave their children water and traditional herbal infusions earlier than advised. Healthcare workers confirmed that liquids and foods are commonly given to infants before the recommended six months.

> Just after the birth, at hospital we were said not to give children water before six months. But once back home, we don't respect that. Some start giving water from three months or even one month.
> *Group discussion: mother, 31 years old, five children*

In the interviews, mothers were asked how they know when to give their children the first complementary foods. When the mothers answered this question, they often told us their idea of the appropriate age for moving on to different foods. Mothers argued that the appropriate age to start complementary feeding was over five months on average, which was similar to the age they reported their youngest child have been, when s/he was given the first foods. In the group discussion, many mothers claimed that they start complementary feeding when the child is six months old. It is, however, possible that the group situation influenced mothers' answers. Mothers may have repeated the recommendation they had heard, so that participants and researches would get a good impression of them.

Some mothers knew or at least referred to the concept of vitamins and "nutritional elements". Mothers knew that children should not eat the same foods every day, and they emphasized the importance of a diverse diet with foods of different colour. Mothers also linked monotonous diet to diseases and stunting. However, mothers said that feeding children with variety of foods was only possible, if the mother had money.

> If you don't give the child what you should give him, it may cause it [stunting]. If the child eats the same food every day, the child gets the same nutritional elements all the time. Moreover, if you don't give the child oranges, eggs or any other foods which are rich in vitamins, your child will become stunted.
> *Group discussion: mother, identity unknown*

Interestingly, some mothers claimed that variety in foods could also be harmful. If there were too many choices, children would eat too much, and they would become stunted:

> That situation [stunting] may be caused also because you feed your child too much. The child will stay there totally passive looking at you. If he starts eating foods without taking [traditional] medicines his body won't be really 'ready to move'. His friends would be playing but he couldn't, and you will be afraid.
> *Group discussion: mother, 23 years old, two children*

Healthcare professionals disputed mothers' knowledge on stunting and claimed that mothers do not know that poor diet can cause that. According to them, mothers do not recognize the symptoms of stunting, and they only come to the clinic when their children are already suffering from other diseases such as malaria or diarrhoea.

> It isn't that she is not interested but she thinks she is already doing enough.
> *Key informant group discussion: Medical assistant*

> […] in reality, mothers don't link stunting to the child's diet. As I said, perhaps at that state of stunting other illnesses will come. And that is what will lead them to hospital. And when we discuss with them, you feel that they don't realize that it is what they give to the child that leads the child to such a status.
> *Key informant group discussion: Director of health centre*

In conclusion, mothers seemed to have fairly good knowledge of the basic child feeding recommendations. However, as described in the previous section, mothers' accounts of the most suitable complementary foods were not always in line with contemporary nutrition knowledge. Moreover, healthcare workers' position was that mothers' inadequate knowledge of child feeding is one of the main determinants of poor practices. I will elaborate this in section 6.3.4, when the influence of healthcare services is discussed.

6.3.2 How children themselves influence feeding choices

In this section I will discuss how children's behaviour and cues influence the decisions that mothers make about feeding and food choices. The interviews and group discussion revealed that mothers made many child feeding decisions based on, for example, child's health, age, appetite, cues and development level.

As described in the previous sections, mothers observed children's reactions to different foods. If the children fell ill, mothers stopped giving those foods. Healthcare workers too described how mothers take into consideration the consequences that eating a particular food had on children.

> […] if just after eating that food, the diarrhoea started. You should understand that such food is not good for his stomach so you have to give it up. *Group discussion: mother, 21 years old, two children*

Mothers evaluated children's ability to move on to eating more solid foods with respect to child's age. Sometimes mothers started giving certain foods solely based the child's birthday or for example vaccination period, which indicated the child's age. All the children in our sample had birth certificates, so mothers know quite well when their children were born, at least if they were literate.

Child's readiness was also evaluated through notions such as "the child is not grown enough" or "not old enough to eat same foods as us". Another clear sign for mothers was the eruption of teeth. When the child develops a particular tooth, mothers should stop breastfeeding. On the other hand, the lack of teeth was also used as an argument against foods that are hard to chew, for example cassava, hard rice and fish. Mothers pointed out that children are ready for those foods when they have teeth.

Mothers experimented child's capability to move on eating "adult foods" by giving them small samples of food. If children ate the food given to them, mothers conclude them to be ready. A child's refusal was often taken as a sign that s/he was not ready for that food, or that the food was not suitable for him/her. Giving the children a taste of food was especially the practice regarding foods that contain chili pepper, explained in the following quotation:

> Before the child will be eight months, you have to start giving him the spicy food little by little. Then the chili pepper will not be too much in the food, you'll just put your finger into the sauce and put it into his lips and if the child starts taking it little by little, it'll do something to his stomach and he will drink the porridge very well.
> *Group discussion: mother 31 years old, four children*

Crying was the most common cue that indicated that the children needed to be given more food. For mothers it meant that they should either breastfeed more often or to start complementary feeding. Mothers reported that they took crying as the cue to offer children the first complimentary food, gruel or start giving them *pâte*. Moreover, the quantity the child drank breast milk, was also a cue to offer more foods.

> At the beginning, he is satisfied by breast milk only and used to sleep well just after breastfeeding. If the child does not cry, he sleeps well. But when he comes to certain months, he will start crying and if you want to work, you won't to be able to. [..] You have to carry him and breastfeed him and then you realize that if you give him porridge, he'll be satisfied. Then you'll notice that the child was hungry.
> *Group discussion: mother, identity unknown*

Mothers also observed child's spirit and mood. Foods were considered to be good for the child, when s/he was happy, laughing and playing. Another cue was the interest that the child expressed towards a food. If the child sees a piece of food and puts it in her/his mouth, mother knows the food is suitable for the child and s/he is ready to eat it. Furthermore, if a child makes sounds or mumbles when seeing foods, his/her mother knows that the child wants to eat those foods.

> […] if baby comes to you when you are eating yourself and opens his mouth, you understand that you have to give him a little portion of food.
> *Interview: mother 28 years old*

A comment made by the mothers surprisingly frequently had to do with their belief that the children could actually decide themselves what and when they want to eat. Mothers told how "child finds and eats" or "accepts to come to eat with the family" or "starts asking to eat when he sees you are eating". And finally, child was considered to be ready to eat family foods, when s/he can eat by him/herself.

As shown above, mothers seemed to be rather sensitive to child's cues, behaviour and development. In addition, a few of the more experienced mothers emphasised that every child is different and child feeding decisions should be made taking into account the characteristics of each individual child.

> What we are forgetting is that all the children are not the same. There are some who start eating at three months, but there are others who may be one year or two years, but who don't really eat. No matter the way you give it. They will only eat if you stop breastfeeding, otherwise they won't.
> *Group discussion: mother, 31 years old, five children*

To sum up, the behaviour of the child was a very important determinant in child feeding choices. Mothers made decisions both based on children's age and on their development level. This may be advantageous for children as they do develop at their own pace. However, the personality or temper of the child may also have a great impact on how and how often s/he is fed, especially if caregivers think that children themselves can decide when and how much to eat. The more active and decisive children may be fed more often than passive and calm children. If the passiveness of the child is due to stunting, other forms of malnutrition or diseases, the passive feeding style might worsen the situation.

6.3.3 Influence of the household context

According to my analysis, the factors influencing child feeding on the household-level are related to the custom of having family meals, mothers' time constraints and the role of the fathers in the household. Also grandmothers, especially if they are living in the same household, may have power over decisions about child feeding.

Family meals

A common practice in Beninese culture is the custom of "family meals", meaning that the family shares the food and eats together. The food is usually prepared by the mother, and so it was in our study too. In the interviews, only three mothers reported that the grandmother or an older sibling had cooked for the child, in the temporary absence of the mother. Mothers were also usually the ones feeding their children.

Mothers and healthcare professionals talked about the practice of preparing separate meals for young children very differently. In the interviews, nearly half of the women told that they usually make separate meals for their children (table 7). In the focus group discussions, mothers emphasized that separate meals were made if the food was too spicy for children to eat.

> We look at the age of the child, before we prepare separate food for the child. If the child is six months then you start cooking *pâte* for him, you have to cook separate sauce for him and the *pâte* should be soft so that he can eat.
> *Group discussion: mother, 31 years old, five children*

However, in the group discussions with key informants, this information was disputed. Healthcare and social workers claimed that mothers do not actually make separate meals for their children. They guessed that mothers were just repeating what they were told by the healthcare professionals. Key informants pointed out that making separate dishes for children is not an African habit because families eat together "from the same pot". Female participants in the key informant discussions described how even for them cooking two separate meals was a laborious task.

> Everybody eats together. So if the family eats something, the child eats the same thing. […] To say that they used to separate food for their children, it is a lie. That is just because, they have heard about that through information programs. And they want to make you believe that it is what they usually do. But I ask myself if we go there today by surprise, if we will see two pots: one for the family and one for the child. You won't see it, because it is very hard even for us who are healthcare workers and who advise them. It is a big job and it is really expensive.
> *Key informant group discussion: assistant, social promotion centre*

Moreover, in the group discussions some mothers argued that preparing separate meals was too expensive and time consuming. Many also stated that there was "no use" to cook separate dishes. Therefore, the result that 14 out of 30 children were eating separate foods (table 7) should be regarded with caution. Mothers may have thought gruel as "an own food for children" as it is sometimes separated during the process of cooking maize porridge, *pâte*. In this case mothers were not actually answering to the questions, whether for example separate sauces were prepared for children. This result proves, however, that mothers have heard the advice of preparing separate meals for children and they think it should be done, even though in reality they might not be able to.

Decision-making about feeding

Mothers appear to have a lot of power in deciding what and how to feed their children, at least according to the mothers themselves. In the interviews 21 out of 30 mothers stated that they made the decision regarding child feeding. In three cases it was the father, in three the mother and father together and in two the grandparent. One mother could not answer the question. Also mothers in the group discussions claimed that they were the ones deciding about child feeding.

In the interviews, we also inquired who in the household decides about food purchasing or taking the children to healthcare. Only nine mothers out of thirty said they made these decisions. The husband made the decisions in nine cases and mother and father together in eight. Four mothers told us that the decision-maker varies according to the issue. Thus, it seems that fathers often make the decisions about the use of household's money.

> *Mother:* Before we feed our children, it is the fathers who give us the money. Then we cook food and give it to our children.
> *Moderator:* What about the fathers?
> *Mother:* [laughing] Fathers go and come back, but mothers are those who stay at home taking care of the foods all the time.
> *Group discussion: mother, 32 years old, four children*

> Here in this community I've noticed that it is the mother herself who makes an effort to understand that her child must be fed. And when she is given what she has to be given [money from husband] she tries to manage it in her own way to

> feed her child as she can. We can't say that it is the father who influences child's feeding. Otherwise, as far as I am concerned, my father used to control our meals. But today it isn't my husband who does that, I do it by myself.
> *Key informant group discussion: Nurse*

Since fathers control how money is spent, they have a great deal of power over food choices. Healthcare professionals had observed that if father is educated, he will try to influence child feeding. Healthcare and social workers seemed to think that unless fathers were informed about child health and feeding, they would not think spending money on children's foods was useful.

> I think that the husbands are those who influence, I say that because, it depends on the husband's means. Suppose he has in his pocket 500 F [1€] he imposes to the mother what she should give to the child. Even if the mother says that the child should eat this or that for a good growth, he says no, this is what I have, and I want you to cook *pâte* [maize porridge] for my child. Or for the sauce, just cook *adémin* [bush okra] or okra. And the mother has to obey the father. I agree that mothers make a great effort to take care of their children, but even if the husband has little money he imposes his will: 'If you want to cook fish it is your problem'.
> *Key informant group discussion: Secretary of social promotion centre*

It is possible that mothers thought mostly about breastfeeding when they answered the question on feeding choices. Decisions about how often and when to breastfeed are probably made by the women themselves, especially in these communities, where mothers breastfeed their children long and on demand, and where there are hardly any restrictions about where women can breastfeed. The question of whether women can actually decide what complementary foods they give to their children cannot accurately be answered based on this data. Even if the mothers can decide when they cook for their children, are they actually able to buy nutritious foods such as fish, if their husbands do not approve?

Influence of grandmothers

In previous studies, the influence of grandmothers on child feeding has proven to be significant (see section 2.2.3). In this study, some of the mothers told us that their mothers and mother-in-

laws had sometimes advised them about child feeding. Often the advice concerned the use of herbal infusions, a traditional medicine given already to new-borns.

> Yes it happens very often. For instance, when we say to the mother not to give other foods apart from breast milk for six months, they say 'What! No, we are used to giving traditional medicine'. And often they give the traditional medicine and it is not adapted to the child. And the grandmothers really want to come and hear by themselves, if it is really the healthcare workers who say that. We encounter that.
> *Key informant group discussion: Nurse, infection prevention and sanitation manager*

Healthcare workers evaluated the role of grandmothers to be much greater than the mothers themselves saw it. Some mothers reported that they do not follow the advice from their elders:

> For my first born, my mother was with us and she was saying all the time, that the child should not eat too much salt. So when she cooked sauce, she added too much water. But I don't take it, I refuse. When I was back home, I prefer what I want as I want, and I eat it with my child. She was all the time advising me, saying that it is what she learned from her elders and that is what she has to teach me.
> *Group discussion: mother, 20 years old, three children*

One healthcare worker explained that sometimes grandmothers follow mothers to the clinics to see whether the nurses and doctors actually advice the mothers the way they have explained at home. The contradictory advice from healthcare workers and the older generation might cause difficult situations in the household. Healthcare workers stressed that grandmothers have influence especially on traditional practices such as adhering to food taboos.

> Most of the time we see that those elders influence negatively, especially if there are food taboos in these communities. These elders are gate keepers. […] And at home, if the mother wants to apply [the advice of giving eggs to the children], the grandmother will say 'when have you ever seen someone giving an egg to a child?' So they play that role of negative influence on the level of the household.
> *Key informant group discussion: Secretary of social promotion centre*

As we did not interview grandmothers separately from younger mothers, it is impossible to say what their actual influence on child feeding might be. This also depends on each household and,

for example, the living distance of the grandparents from the household. Grandmothers' impact on child feeding appears to be especially significant with regard to indigenous knowledge of child care; they act as guardians of tradition. In this study, mothers and key informants only brought up somewhat negative practices such as the use of traditional medicines and the existence of food taboos in some families. However, based on my analysis, the mothers were not following the traditional dietary taboos. Grandmothers' knowledge of local wild foods and traditional ways of cooking, for example, was not discussed. Therefore, although the grandmothers' "negative" influence on the child feeding practices is decreasing, they might still have a lot of indigenous knowledge, which could be advantageous in improving the diversity of children's diets.

Mother's workload

Mothers in these rural communities are often burdened with housework and agricultural activities. We asked participants in the individual interviews to describe their ordinary day. Mothers reported they cleaned the house, did laundry, bathed and fed their children, cooked, fetched water and did other housework. They also worked in the fields, and sometimes they sold food or did other work, since majority of them had ways to earn income (table 4). Mothers work burden increases, when their spouses leave to search for work elsewhere, as described later in this section.

> The family burden doesn't allow mothers to feed their children in a better way. Because the burden is too heavy and they don't have assistance from their husbands, so they have to deal with what they have.
> *Key informant group discussion: assistant, social promotion center*

Mothers did not usually explain their child feeding choices by the lack of time or energy. It is, however, one possible explanation for not cooking separate meals for small children, since cooking is time-consuming. Some mothers explained to us that they give gruel to their children in order to be able to work, because the child's cry would distract them.

Since we did not observe the mothers for an entire day at a time, it is impossible to for me to say, how much time they actually spend in child care and feeding. Based on mothers' answers and on the fact that most of the women were working outside home for at least some hours during the day, I presume their attention is divided between different tasks. Mothers may not therefore have

enough time to focus on feeding their children, or to make sure that the children eat what is given to them.

Rural exodus and the absence of fathers

A considerable social problem in the villages was the rural migration to urban areas. Especially the men tend to leave the villages in search for work, leaving their families behind. According to our interview data, five out of thirty women were left alone to take care of their children, whilst the father was absent gaining money for the family. In the study area, most men went to Nigeria or to the economic capital, Cotonou. The social and healthcare workers considered this to be a factor that impairs child feeding in the communities.

> […] in most of the rare cases of malnourished children we get, the husband or child's father is in Nigeria and the mother who is a housewife has to manage alone to feed three or four children. She doesn't always succeed in filling these responsibilities, and the husband at his side doesn't send anything to help. So these children lack assistance and that leads to malnutrition and undernutrition cases
> *Key informant group discussion: Nurse, infection prevention and sanitation manager*

The participants from the social promotion centre also raised the issue of mothers leaving their children:

> […] that is why [because of poverty] we see many abandoned children. As he has said, we see some women who give birth and go to Nigeria and leave the child to the grandmother. And she is the one, who should take care of him.
> *Key informant group discussion: Director of health centre*

Also the mothers considered the fathers' absence a problem. The mothers said: "you have to do what you can, if there is nobody to help you". One mother posed a question to researches right in the end of one group discussion:

> Talk to the men they are used to living alone, and we are alone to take care of children.
> *Group discussion: mother, 23 years old, two children*

Rural exodus results from poverty in the villages and the lack of ways to get earnings. I will discuss poverty further in the next section.

6.3.4 Influence of the community context

According to my analysis, complementary feeding in the study villages is influenced by community context, including poverty and the availability of and access to food. Moreover, the access to health services also plays a part.

The local economy and poverty

Poverty is perhaps the greatest barrier to optimal infant and child feeding practices in these rural communities. For mothers it was the main reason why they could not follow the recommended feeding practices. Money was thought, according to the mothers, to be "the head of problems".

> You have mentioned fish, egg, milk; all those things are good for the child's growth. If you have money, you will raise the child in that way. But if you don't have, you cannot do it. Because we are living in the rural area, we can't raise our children in that way. I've never done that.
> *Group discussion: mother, 41 years old, three children*

> Children are not well fed, because we women, we don't have the capacity. We don't have enough money. And mothers give to their children what they find, and it creates problems to the children.
> *Key informant group discussion: Medical assistant*

Poverty affects the variety and the quality of foods and it also, according to the mothers, how many times the children eat each day. Many mothers stated that feeding their children more than three times a day would be optimal, but that it is not often possible, especially when food is not available.

> Because we don't have the money, he will drink breastmilk and porridge and he can eat *pâte* [maize porridge] like three times in a day. It's not good for a little child to eat *pâte* like that.
> *Group discussion: mother, 31 years old, five children*

Moreover, some mothers expressed that giving snacks to children was not possible due to the fact that mothers could not afford it. Healthcare workers account on feeding habits appeared to confirm this, for according to them, giving foods between meals was not common in the villages. According to healthcare workers, mothers do not have the money to buy snacks or they prefer selling foods that they produce.

> Snacks are for educated people those who know a bit about the issue, people in the village don't know what to give. No one of them ever give snacks to the children. Even if she has a basket full of oranges, she won't give it to her child. She prefers selling it. So if we say they give snacks, it is a mistake. They are for the educated people. And they are not numerous.
> *Director of a health centre, group discussion*

Lack of money was always the mothers' first answer to questions about why they fed their children in a certain way. Every time we asked about the possibility to use products, such as meat, milk or eggs, the first answer was that "there is no money". Furthermore, the inquiry about how "good mothers" would feed their children was met with a responses, which insinuated that mothers believe they could not be good mothers with the resources they have at their disposal.

For healthcare professionals too, the lack of resources was the most popular reason for stunting or for poor feeding practices. A few of the key informants posed, however, an opposing argument, saying that the biggest barrier to optimal child feeding is not in fact the lack of money, but rather the lack of knowledge. They believed that ingredients to adequate diet already existed in the villages, at a low cost. Informing the mothers about how to use and cook local foods was the key solution they offered for improving feeding practices.

> *Social assistant:* It is true that money is important, but there is also the matter of organization within the household. Because when we talk about child feeding using local foods, we don't need many things. We have our juice made of palm nuts, we have cassava leaves, and we have the small fish *dowèvi*. So I think we have almost all, so the most important is the matter of organization.
> *Moderator:* So you don't think money is the most important barrier?
> *Social assistant:* No, I don't think so. I think it is the lack of information.
> *Key informant group discussion: Social assistant*

Even those key informants, who first answered that money was the biggest barrier, later stressed the importance of educating mothers about child feeding.

> […] but most of the time their [children's] weights are low and we try to advise them on how to use basic products, because we can't say they don't have it. They have all, but what is important, is to know how to use them in order to keep their children healthy.
> *Key informant group discussion: Director of health centre, nurse*

Mothers reacted to the money issue perhaps more strongly than the healthcare professionals. Even though mothers considered poverty to be the biggest barrier to optimal child feeding, other determinants of complementary feeding may still be significant. From the mothers' perspective, poverty and lack of money might naturally be "the easiest" explanation for current practices. Admitting that you do not know what you should give to your child might psychologically be more difficult than blaming the lack of resources for the deficiencies in child feeding. Mothers may have also felt that they need to give the researchers an impression of poverty so that the possible money or projects would come to the community. We noted that the village elders, who we talked to in order to get background information of the villages, emphasized the need for monetary assistance. Even though we stressed the nature of the research project, mothers often asked us at the end of the group discussions, if we were planning to come back to "help the village".

The availability of food

The availability and access to food was mainly influenced by seasonal variety, distance to markets and, of course, the lack of money.

Families are highly dependent on their own agricultural production, which means that seasons have a large impact on the availability of the food. During the rainy season some household may experience shortage of foods, since strong rains may destroy the harvest. Furthermore, the availability of foods may be poor and food prices high in the markets. When asked specifically, most of the mothers replied there was seasonal variety in the availability of food. Mothers informed that sometimes maize, beans and rice were hard to get, especially if you could not afford buying them. At the time of the field work, the small rainy season was ongoing, and this

may have influenced mothers' answers. In addition, some reported scarcity of fish even though both villages were surrounded by lakes.

> How could you get it? There is no fish in the lake. At the arrival fisherman will present just one or two fish. That is why right now the most common foods we use are *adémin* [bush okra] and *dowevi* [small fish].
> *Group discussion: mother, identity unknown*

The distance to markets was quite long from both of the villages. There were some foods sold at the villages, but for a larger selection one had to walk several kilometres, over ten from Sohounmè and from the most remote parts of Akotomey. Therefore the distance can also be considered a barrier, even in those cases where mothers had the sufficient financial means to enrich the diets of their children.

Finally, the availability of food in the villages and households did not entirely reflect the diet of young children. For example, most of the households in the villages practiced farming and had livestock. However, only few mothers reported they give eggs to children weekly or more often, even though nearly one-third of the families reported raising chickens for eggs.

Availability and accessibility of healthcare services

The discussions with the healthcare and social workers revealed that the health and social services in the region were not functioning as they desired. According to them, the barriers to give proper infant feeding counselling to mothers were long distance from the remote villages, and the lack of staff and medical infrastructure.

Functioning healthcare system could have substantial influence in improving child feeding practices in the region. Now mothers had only received advice about feeding either after giving birth at the hospital or during the few vaccination visits at the health centre. The weighting of children during their vaccination appointments was, according to healthcare professionals, the most effective way to monitor the growth of the child and the quality of their diets.

> Thanks to the vaccination appointments, we can note the malnourished with weight below normal and give advice in order to improve feeding practices. […] I would encourage mothers to vaccinate their children, because each time they come,

> we always have something to say. So if they can come out to meet us [in the health centres], we follow them until one year and a half.
> *Key informant group discussion: Director of health centre, nurse*

Healthcare workers also stressed that they should go to the villages to inform mothers of optimal feeding practices. There had been some information programs organised by NGOs but they were not functioning at the moment of research. Healthcare and social workers described that these NGOs had organised group meetings and cooking demonstrations.

> Before, there were some programs like that in the social promotion centres. The moderators even went to the village and there were meetings where the mothers were informed. But today, we see nothing of that. In some areas there are projects where moderators go and give nutritional advice.
> *Key informant group discussion: Director of health centre*

Healthcare workers emphasized the need to recruit and train volunteer workers, village inhabitants who could advice mothers about child care in the communities. These voluntary moderators are mothers who live in the villages, know the people and local customs, and are trained to give advice about child care. They observe mothers and if they see a sick or malnourished child, they advise the mother on how to feed the children and in how to cook for them. A Danish NGO used to train moderators in Sohounmè region, so there are still women who are fairly recently trained to advice other mothers. The medical assistant attending the group discussion told us that she was trained by the NGO.

> If resources and money really existed, it would be good to train community relay […] We can select some mothers and teach them with practical demonstrations about cooking. If I take for example *pâte*, everybody knows how to cook it. As far as sauce is concerned, we have all with us, but how to mix the ingredients. Those women who are trained will in turn train other women. So if we have community relay, with assistance of healthcare workers and those of social promotion centre we are sure to get good results.
> *Key informant group discussion: Director of health centre, nurse*

In addition, healthcare and social workers talked about the importance of preventing malnutrition and of targeting those families who are at risk of malnutrition:

> […] there are children who are abandoned [by their mothers] in case of divorce. And those are the cases we have to particularly supervise. […] if they have to be supported by the grandmother, and we don't supervise them, the child can quickly become malnourished.
> *Key informant group discussion: Director of health centre*

We did not ask the mothers, if they needed advice or training from the health facilities. However, before each discussion we enquired why mothers wanted to attend the focus group. Many of them told us they wanted to learn from others. In addition, at the end of each group discussion, we asked mothers whether they had any questions about the study. Quite often mothers asked specific questions about child feeding. Due to ethical protocol we could not answer these questions, because of the plan to continue the study in the area after our field work. However, these questions indicate that mothers are interested in the subject and might be interested in attending group meetings, if such meetings were organised.

> Could you tell us about the foods that contain vitamins, because we don't know what to give them.
> *Group discussion: mother 31 years old, four children*

In conclusion, the group discussions with key informants have shown that there would be a need for more in-depth training and communication programs in the villages. Practical problems, such as poor road infrastructure and distance to services can act as a barrier for women to visit medical professionals. Community volunteers, who could train mothers in the villages, could be one feasible solution to distribute information in Sohoumè and Akotomey.

7. DISCUSSION

The following chapter reflects my results against the findings in previous studies. Firstly I will evaluate the quality of young children's diets and secondly the barriers and enablers for optimal infant and young child feeding practices. Limitations and strengths of the study are also discussed.

7.1 Reflection on the findings

7.1.1 Evaluation of the quality of children's diets

According to my findings, complimentary foods of children aged 6 to 24 months had low dietary diversity, which in turn presumes inadequate nutrient intake (Arimond & Ruel 2004). The most common complementary food was liquid maize gruel or thick maize porridge (*pâte*), which was served with sauce of green leafy vegetables. Animal source foods were limited in children's diets; flesh foods, milk and eggs were rarely offered. This might lead to insufficient intake of some essential nutrients, such as iron and zinc (Krebs 2007). In addition, the consumption of vegetables and fruits, especially vitamin A-rich, seemed to be below the optimal intake level. The use of red palm nut oil and pulp as a base of sauces may enhance the intake of vitamin A (Amoussa-Hounkpatin et al. 2012), but how much children actually eat these sauces cannot be accurately determined based on this data.

According to my findings, complementary feeding of children started before recommended six months. Use of traditional herbal infusions right after birth was common practice. This has been seen in other rural communities (Kerr et al. 2007) and has also been previously reported in Benin (UNICEF 2009). Other liquids were offered around three months of age and liquid gruel around six months. According to healthcare professionals, the actual starting age of foods might be even earlier than this. The duration of exclusive breastfeeding was three months on average, maybe even shorter, because it is possible that all mothers did not report giving traditional medicine. Around six months or later children are offered the first family food: maize porridge, *pâte* with different sauces. According to the DHS data from Benin, half of children are breastfed at two years (INSAE & ICF International 2013). In our sample mothers reported having breastfed their older children for two years, on average.

As we used qualitative methods to collect the data, it is impossible to accurately estimate the quality of children's diets. However, my results provide an overall idea of the situation in the villages and these results are in line with previous reports from Benin (INSAE & ICF International 2013, FAO 2011, UNICEF 2009).

7.1.2 Evaluation of barriers and enablers of optimal complementary feeding

The figure 3 presents possible barriers and enablers of optimal complementary feeding, which I have evaluated in my research. These enablers and constraints presented are based on my analysis of maternal knowledge framework of complementary feeding and the influence of household and community context on feeding practices. Some of the determinants can be regarded both as barriers and enablers and they are thus presented in the middle of the picture. In the following, I will describe these enablers and barriers in more detail and compare them with previous studies.

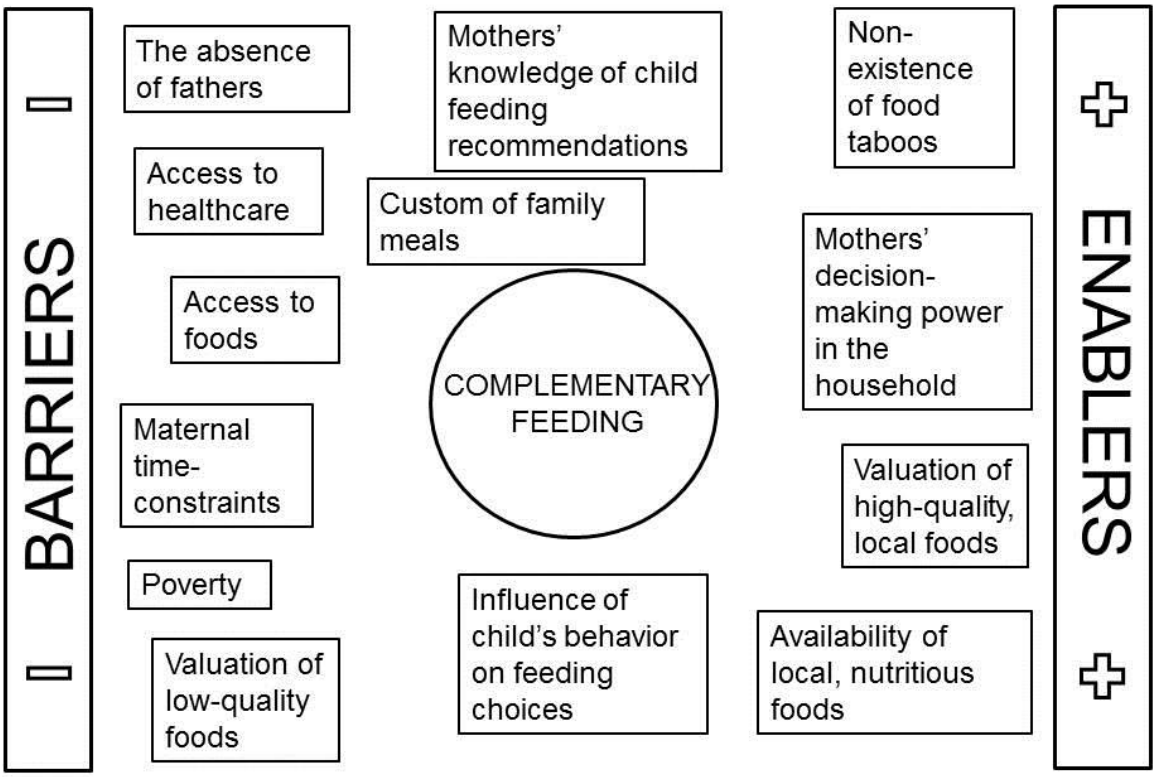

Figure 3: Barriers and enablers influencing complementary feeding practices in the study villages

Mothers' knowledge of child feeding

According to my findings, mothers' knowledge about suitable foods for young children was sometimes limited and they consequently valued foods of poor nutritional quality over others with better nutritional value. Previous research has shown that inadequate knowledge of nutrition can worsen child feeding practices (Paul et al. 2011, Lindsay et al. 2008, Appoh & Krekling 2005, Kruger & Gericke 2003). Mothers in this sample regarded macaroni, maize gruel and porridge to be healthy and good food for their children. The valuation of macaroni is alarming, as it is a costly food for rural population. Moreover, the nutritional quality of macaroni and maize porridge is poor, if they are not supplemented with more nutritious foods, such as eggs, small fish or legumes.

Furthermore, it seems that mothers lacked knowledge in appropriate cooking methods for preparing foods suitable for small children. Some foods were avoided, because they were thought to be too hard for small children to chew. Similar findings have been reported in other regions as well, for example in Mexico (Monterrosa et al. 2012), in Nigeria (Bentley et al. 1991) and in Zimbabwe (Paul et al. 2011, Cosminsky et al. 1993). Moreover, mothers rarely prepared separate foods for their children as the communities had strong custom of family meals. This may impair children's nutritional status, if they are offered foods that are spicy or otherwise inappropriate for them to eat. In addition to lack of knowledge, mothers' time constraints are probably one reason that prevented mothers from preparing separate meals for their children. Previous studies have shown that maternal time constraints may lead to the use of easy-to-prepare complementary foods (Pelto et al. 2003).

By analysing the rationale behind mothers' food and feeding choices, I discovered that they make many decisions based on child's development level and cues. Child's cry was believed to be caused by breastmilk insufficiency, and it was a cue for mothers to start offering complementary foods. This has been reported in other regions as well (Kerr et al. 2007, Engle et al. 1997, Cosminsky et al. 1993). Also child's appetite was evaluated as has been shown in studies by Bentley et al. (1999, 1991). Child's development level such as motor development, the eruption of teeth and the ability to eat foods was referred to when mothers decided about appropriate foods. Also studies made in Mexico (Monterrosa et al. 2012), in Tanzania (Sellen 2001) and in Egypt (Harrison et al. 1993) have reported this.

Abovementioned rationales can be both beneficial and malign for improving practices. Mothers appear to be used to observe each child individually and they are sensitive to changes in behaviour, such as cry and illnesses. However, some mothers explained how children themselves express when they are ready to eat certain foods. In case of an ill or malnourished child, this might worsen the situations, because phlegmatic children may not have enough energy to "demand more food". Cases like this have been reported previously in rural Malawi (Dettwyler 1986) and in studies of the influence of temperament on nutrition outcomes (Wachs 2008, deVries 1984).

An encouraging finding from this study was that there were no strong food taboos or avoidances concerning complementary foods of young children. It is possible that food taboos have existed before (e.g. Ogbeide 1974), but that they are no longer important. The question of "bad foods" for children was often left without answers. Mothers' accounts of the consequences of unsuitable foods (diarrhoea, worm infection etc.) were mostly likely not caused by the food itself, but due to unsafe preparation or storage of foods. By educating mothers about the proper food preparation these moderate beliefs could be altered.

Despite some possible malign beliefs, many mothers had fairly good knowledge of, for example, the importance of variety in children's diet. Mothers classified foods based on their perceived healthiness. Their beliefs about foods were sometimes very close to contemporary nutrition knowledge, as has been seen in Ghana (Pelto & Armar-Klemesu 2011) and in Mexico (Monterrosa et al. 2012), even though a large share of mothers had not received any education. Mothers also repeated messages that they had heard from the healthcare workers, such as the recommendation of exclusive breastfeeding and refraining from giving spicy foods to children. Furthermore, a potential enabler might be that mothers valued locally available, nutritious foods, such as eggs, beans and green leafy vegetables. These foods could potentially increase the nutrient quality of children's diets, if they were given to children. For example peanuts, fish and beans were affordable and available in the villages.

Decision-making about child feeding

According to mothers themselves, they have fairly strong decision-making power in the household about child feeding. If mothers have power over food choices, children's diets can be improved by educating women only. As we did not interview fathers nor grandmothers, their true

influence and interest on child feeding remains unknown. According to healthcare workers, the grandmothers in the villages try to maintain the traditional ways of childcare. Mothers emphasized, however, that they do not always listen to the advice of the older generation. In previous research, grandmothers' influence on child feeding has been substantial (Aubel 2012, Fouts & Brookshire 2009, Bezner et al. 2008, Lindsay et al. 2008, Kerr et al. 2007, Bentley et al. 1999). Even though grandmothers may not have a negative impact on child feeding practices, they might have a lot of indigenous knowledge that could be beneficial in improving the quality of the care.

Fathers in these villages controlled over how money was spent and made decisions about food purchasing. Fathers thus indirectly control the diets of young children. Some studies have contradicted fathers' importance on day-to-day child care and feeding decisions (see review by Aubel 2012). However fathers may still have an important role in improving child feeding practices. Involving fathers to nutrition counselling could be one solution to ensure that they understand the importance of for example animal-source foods in young children's diets (Abubakar et al. 2011, Mwangome et al. 2010).

The influence of poverty

Poverty seems to be the biggest barrier to optimal complementary feeding practices limiting the access to high-quality and nutritious foods. Poverty affects child care in many ways in these communities. In previous research, poorest households often have increased prevalence of stunting (Bhutta et al. 2013) and lack of money had prevented them from buying some of the more expensive foods, such as meat and eggs (Monterrosa et al. 2012, Hampshire et al. 2009). As we did not ask mothers' income or how much certain foods cost at the market, it is impossible to say, whether more nutritious foods were in fact out of the women's reach.

Most of the households cultivated crops or they had livestock. However, according to my results, the availability of foods in the villages does not entirely reflect the diet of young children. Families may prefer selling the food their produce rather than giving it to children (Paul et al. 2011). Therefore, if alternative ways to generate income were provided, the foods produced might actually be consumed by young children. Moreover, education about appropriate complementary foods is also crucial. In fact, previous research of "positive deviants" has shown

caregivers' practices and beliefs to be more important determinant of good child care than the economic situation in the household (Appoh & Krekling 2005, Berggren & Wray 2002).

Poverty is also probably one of the underlying factors that impair the healthcare services and forces fathers to migrate in search for work (Stewart et al. 2013). The access and availability of healthcare was a barrier that decreases the child feeding counselling mothers receive. The distance to health facilities was sometimes long, and professionals there did not have enough time to advice mothers. Male labour migration and fathers' absence from families increased mothers' already heavy workload, impairing in turn the care of young children. Even though male labour migration might increase household's income, unsuccessful migration has been seen to increase the mortality of young children, when migration induces such changes in household's daily life as increasing mothers' workload and causing stress (Yabiku et al. 2012).

In conclusion, the barriers to optimal child feeding practices in the villages are poverty, mothers' sometimes poor knowledge of appropriate complementary foods, maternal time constraints, custom of family meals, fathers' absence from households, access to some nutritious foods and finally access to healthcare and child feeding counselling. Some of these barriers could be altered through education, but others would need substantial changes in the underlying determinants of poverty. Furthermore, this study has also revealed many possible enablers such as mothers' relatively good knowledge of some child feeding recommendations, availability of local nutritious foods, lack of food taboos in the villages and mothers' decision-making power in the household. These enablers should be reinforced in addition to tackling the causes of poor practices.

7.2 Reflection on the methods

7.2.1 Limitations of the study

Limitations of this study are related to the limited time available for data collection, the challenging qualitative methods used, translations and the practical difficulties encountered during the field work.

Short field work period

Short field work period is a limitation of this study. In this kind of qualitative, ethnographic research the researcher stays "in the field" sometimes several months. We only had three weeks

for data collection in the villages. Due to our tight schedule it was not possible to properly pre-test the focus group discussion guide, but instead the first group acted as a pilot group. With a few extra days we would have been able to conduct a proper pilot-group or two and to spend a couple of days revising the questions.

We conducted the individual interviews first, the focus group discussions second and the observations for last. The reason for this order was that some mothers who attended the interviews were also recruited to participate in the observations. Therefore we needed to start the field work with the individual interviews. Retrospectively, it would have been better to conduct the group discussions before the interviews, in order to first get a general idea of the infant and child feeding situation. Afterwards, a few days could have been used in formulating new open-ended questions and revising the questionnaire. This would have allowed us to conduct more detailed interviews with more relevant probing during the open-ended questions. Even if this had not been possible, it would have been better to have a few days in between the interviews and focus group discussion in order to have enough time to revise and reconsider the discussion guide.

Language and translations problems

In both the interviews and the group discussions, the language created a limitation for this study. The translators were semi-professional freelancers. Two of them had studied English as a major in the university and the third one had lived in the U.S. for some years. Recruitment of interpreters proved to be rather successful, which helped enormously in the data collection. The interpreters were hardworking and diligent. However there here were a few interviews, during which the interpreter seemed tired and did not translate everything word-to-word. Moreover, the interpreters sometimes had problems with the different dialects and languages in the villages and they could not translate everything exactly.

The simultaneous translations during the interviews might have led to a loss of relevant information. Translators had to make their own interpretations of the answers as they were summarizing the sometimes long answers given by the mothers. As we did not record the interviews, we had to take notes; some things might have not been written down properly. Sometimes we wrote down the local names of the foods as we heard them and then later asked the interpreters to verify if we had written the spelling correctly. There were some cases where we

could not make sense of our notes and the translators did not remember what was talked about. Therefore some unclear names of local foods were left in the data.

Furthermore, the translation of local foods and ingredients was not coherent, but in most cases we were able to verify and correct them later in the data. It should also be kept in mind that the translators had not studied nutrition or health, so the vocabulary was new to them. They were given a small introduction to nutrition problems in the region, but there might have been misunderstandings in the translations, for example concerning the more difficult concepts, such as stunting. For example, during the data collection we noticed that some mothers and interpreters considered gruel as a liquid, as it is often diluted and even drank from a cup. Therefore when mothers were asked about the starting age of liquids they might have thought of gruel (as water and traditional medicine is something most give automatically) and when they were asked about foods they thought about *pâte* and other more solid foods. Therefore the starting age of liquids and gruel might actually be lower than the one presented in table 7.

The focus group discussion is a challenging method that demands a lot from the moderator. We trained the moderator in less than a week, and taking the time limitation into consideration, he did well. However, the discussions might have been more profound, had the moderator had more knowledge of the subject. As things were, he sometimes led the discussion in a direction that was irrelevant for the research questions (e.g. family planning). This happened during the first two discussions, but when transcriptions were made, we talked about the research questions yet again, and the last two discussions were kept on the "right" track.

Furthermore, the recording of the focus group discussions turned out to be somewhat unsuccessful, especially in the discussion with mothers. Our equipment was not suited to record in a setting where there was a lot of background noise. We had two recorders, which we placed in the middle of the circle, but still it was difficult to hear the more silent mothers. Some things may have been left out of the data, because the translators could not make out everything that was said.

Moreover, multiple data-collectors and translators might have decreased the reliability of the study (Silverman 2006). We tried, however, our best to decrease this influence. Before the data-collection, we discussed the content of the questionnaire thoroughly and made exercises in order to find out whether translators translated the questions accordingly. As the interviews were done

on four consequent days, we had time to discuss the way we took notes and understood the questions. Therefore, the data collection methods improved during the process.

Influence of others and distractions during data collection

The group situations may have been difficult to some participants. Some were quieter in the discussion than others. Older women in the discussion usually shared more of their experiences, and the younger ones, probably out of respect, let them speak. However, moderator, who was a teacher by profession, was quite talented in paying attention to the quieter mothers. He asked their opinion and tried to divide turns equally. Nevertheless, the social pressure may have prevented some mothers talking about more sensitive issues and from sharing their views of the topics, especially if their views contradicted those of others.

Moreover, it is possible that the presence of white researchers has probably had some effect on the answers of mothers. They might have been shy to answer some of the questions, or have felt pressured to give a good impression of themselves. However, the interviews and especially the group discussions felt natural and the mothers did not seem to be awkward. Before the data collection we were worried that the presence of male translator would prevent women from talking about intimate issues such as breastfeeding. Nevertheless, mothers had no trouble breastfeeding in front of men, let alone to talking about it.

Finally, some challenges were caused to the data collection by the fact that the discussions and interviews were organised in public places or in people's homes. The focus group discussions were continuously distracted by the by-passing villagers. Often they started to listen to the discussion or wanted to join it. If they did not leave, moderator usually explained the purpose of the group meeting and kindly asked them to leave. Mothers did not seem to be distracted about these interruptions. In one individual interview the husband was present during the whole time. He was told not to answer the questions for the woman, but his presence most likely influenced her answers. A few times the husband showed up, but he was politely asked to leave. Furthermore, mothers brought their children to the discussion and interviews so crawling, laughing and crying children sometimes took mothers' and the interpreters' attention. Sometimes the mother worked during the individual interview, for example once she was baking and selling *dokos* whilst answering the questions.

7.2.2 Strengths of the study

The strength of this study is the use of triangulation. The use of two different data collection methods and two respondent groups has most likely increased the reliability and validity of this study (Silverman 2006). During the analysis, it has been possible to compare the answers of respondents in different situations and to check whether the stated opinions where shared, or whether they represented just the perception of one individual. I have also been able to compare findings using two different research tools. In addition, the systematic coding-process during analysis has increased the validity and the reliability of this study. Pre-testing the interviews was also a way to increase the reliability of the method (Silverman 2006).

Our method of transcribing the focus group tapes also enhanced the reliability. It was a laborious task, but we still tried our best to transcribe *ad verbatim*, despite the bad quality of the tapes. I spent a lot of time discussing the quotations with translators in order to ensure I had understood the idiomatic quotations. The quality of the data would have probably been weaker, if we had only made summaries of the discussions, or if the interpreters had written the translations themselves.

The somewhat random selection of participants increased the credibility of the study. All the mothers who were asked for interviews, agreed to participate. In addition, nearly all the mothers who were recruited for the group discussions attended. In many interview and focus group discussion studies, groups are organised at a certain time and people are asked to join in (Hennink 2007). This might induce bias in participant selection as people participating are those who are interested in the subject. Sometimes participants are recruited with the help of "gate keepers" in the village, and thus the participants are pre-selected for the study. In our study, no aid was received for sampling, with the exception of sampling for the key informant discussions. Even though generalizability of results is seldom the goal in qualitative research, the somewhat random sampling has enhanced the generalizability, at least into the level of the study villages.

8. CONCLUSION

The objective of this study was to explore complementary feeding practices of 6 to 24 month-old children and to identify factors that influence feeding practices and mothers' complementary food choices in rural area of Southern Benin. Qualitative methods were used in investigating mothers' accounts of practices and their rationale for feeding choices. The influence of household and community context was also studied. The subject was researched both from the perspective of mothers and from that of the healthcare and social workers in the area.

Young children in the villages were not fed according to WHO recommendation. Complementary foods, consisting mainly of maize gruel and porridge, were monotonous and especially the intake of animal-source foods was limited. Poverty was the main reason behind poor feeding practices. It limited the choice of foods and time mothers had for child care as they were burdened with other tasks. It is unlikely that mothers had time to prepare separate complementary foods for their children, and therefore the children ate family foods from a very young age on. Mothers seemed to have a quite lot of power over child feeding decisions on the household level: they were the ones deciding what and when their children ate. However, since fathers gave the money for food purchasing, they too had control over foods their children receive. The older generation of mothers tried to maintain the traditional ways of child care.

Mothers' knowledge of infant and child feeding was a mixture of indigenous and contemporary knowledge. According to healthcare workers, mothers lack knowledge about child feeding and about how to prepare complementary foods using local ingredients. An alarming finding was that mothers considered low-quality foods such as macaroni, maize gruel and porridge to be most suitable and healthy for young children. One of the key findings was that there were no food taboos concerning complementary foods in the village. There were hardly any foods that were considered to be unsuitable for young children.

This qualitative study has revealed useful information of local practices and determinants of behaviour that can be used when planning public health campaigns or nutrition counselling. Interventions that aim to improve complementary feeding practices have proven to be effective in many settings and they can potentially decrease the morbidity and mortality of young children. Complementary feeding interventions cannot, however, tackle the underlying causes of

malnutrition, such as poverty and poor sanitation. Long-term investments are also needed in improving the education, empowerment and economic status of women.

Suggestions for future research

The study highlighted several possible barriers and enablers to optimal complementary feeding, but also left many questions unanswered. There is a need to further study the possibilities of developing affordable complementary foods by using local ingredients. Recipes need to take into consideration the fact that mothers are busy with other competing task and that shared family meals are the cultural norm. Complementary foods should be easy to prepare by, for example, separating gruel in the process of making porridge and by adding for example grounded fish, nuts and red palm nut oil to increase the nutritional value.

Moreover, the household-distribution of foods should be further studied in this context. In this study, mothers did not object the idea of giving, for example, meat or eggs to children. However, a question remains, whether these foods would be given to children, even if they were available or if families could afford them. The impact of other influential people on child care should also be investigated. Fathers' attitudes towards complementary feeding should be explored by conducting focus group discussions or interviews. It would be interesting to know, for example, would fathers approve the allocation of existing small resources, so that money would be used on high-quality complementary foods?

Finally, there is a clear need to conduct similar studies in other locations as well, since many of the barriers and enablers influencing complementary feeding are context-related. More research of determinants influencing complementary feeding practices is needed in order to plan and implement effective nutrition interventions, and to better understand the constraints to optimal complementary feeding practices.

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ANNEXES